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September 1977 Number 397-Part I

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Data for August 1977–July 1977

Explanation of Data Reports Issued as Number 390 (Supplement) February 1977

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Solar - Geophysical Data

NO. 397 SEPTEMBER 1977

Part I (Prompt Reports)

DATA FOR
AUGUST 1977
JULY 1977

NATIONAL GEOPHYSICAL AND SOLAR - TERRESTRIAL DATA CENTER
BOULDER, COLORADO

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No. 397

Issued in two parts

Helen E. Coffey, Editor

J. Virginia Lincoln, Director
Solar - Terrestrial Data Services Division

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Note: A = Part I, B = Part II.

386A 22 listed under 1976 Aug shows that data for August 1976 were contained in *Solar-Geophysical Data* Number 386 - Part I beginning on page 22.

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QUALITY CONTROL MARK

AUGUST 1977 DATA

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ALERT PERIODS

INTERNATIONAL URSIGRAM
AND WORLD DAYS SERVICE

AUGUST 1977

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions				Outstanding events	Forecasts			Alert Situations
						Location Lat-Long	No. of Flares Total	M	X		Date	Location Lat-Long	Desc*	
213	1	31	23	78	10	S19W53	0	0	0		1	S19W53	Q	SOLQUIET
						N28W36	0	0	0			N28W36	Q	SOLQUIET
214	2	01	52	82	06	N28W49	0	0	0		2	N28W49	Q	SOLQUIET MAGQUIET
						S22W64	0	0	0			S22W64	Q	
						N21W49	0	0	0			N21W49	Q	
						N12W22	0	0	0			N12W22	Q	
215	3	02	60	80	06	N28W65	0	0	0		3	N28W65	Q	SOLQUIET MAGQUIET
						N23W64	0	0	0			N23W64	Q	
						S07E02	0	0	0			S07E02	Q	
						N19E04	0	0	0			N19E04	Q	
						N24E83	0	0	0			N24E83	Q	
216	4	03	23	80	05	N28W75	0	0	0		4	N28W75	Q	SOLQUIET MAGQUIET
						N23E72	0	0	0			N23E72	Q	
217	5	04	24	81	10	N23E62	3	0	0		5	N23E62	E	SOLQUIET MAGQUIET
218	6	05	43	84	26	N25E42	6	1	0		6	N25E42	E	SOLALERT 06 MAGQUIET
219	7	06	51	86	22	N25E29	1	0	0		7	N25E29	E	SOLNIL MAGQUIET
220	8	07	42	85	23	N25E17	1	1	0		8	N25E17	E	SOLQUIET MAGALERT
221	9	08	49	83	17	N23E11	1	0	0	A MINOR GEOMAGNETIC STORM BEGAN 05/0000 Z AND IS STILL IN PROGRESS BUT IS DECREASING IN INTENSITY	9	N23E11	E	SOLQUIET MAGALERT MINOR 09
222	10	09	43	84	18	N23W10	0	0	0		10	N23W10	E	SOLQUIET MAGALERT MINOR 10
						S22E36	0	0	0			S22E36	Q	
223	11	10	46	85	12	S18W61	0	0	0		11	S18W61	E	SOLQUIET MAGNIL
						N20W23	0	0	0			N20W23	Q	
224	12	11	50	85	24	N24W34	1	0	0		12	N24W34	Q	
						S18W80	0	0	0			S18W80	Q	
						N18E51	0	0	0			N18E51	Q	
						N22E86	0	0	0			N22E86	Q	
225	13	12	42	84	16	N25W49	0	0	0		13	N25W49	Q	SOLQUIET MAGQUIET
						N20E37	0	0	0			N20E37	Q	
						N31E63	0	0	0			N31E63	Q	
226	14	13	64	87	15	N24W62	0	0	0		14	N24W62	Q	SOLQUIET MAGQUIET
						N30E49	0	0	0			N30E49	Q	
						N36E44	0	0	0			N36E44	Q	
						N27E51	0	0	0			N27E51	Q	
						N19E72	0	0	0			N19E72	Q	
227	15	14	87	85	12	N21W75	0	0	0		15	N21W75	Q	SOLQUIET MAGQUIET
						N21E15	0	0	0			N21E15	Q	
						N32E38	0	0	0			N32E38	Q	
						N36E32	0	0	0			N36E32	Q	
						N29E40	0	0	0			N29E40	Q	
						N21E61	0	0	0			N21E61	Q	
						N22W09	0	0	0			N22W09	Q	
228	16	15	67	85	13	N24W83	0	0	0		16	N24W83	Q	SOLQUIET MAGQUIET
						N30E27	0	0	0			N30E27	Q	
						N27E27	0	0	0			N27E27	Q	
						N20E05	0	0	0			N20E05	Q	
						N20E47	0	0	0			N20E47	Q	
229	17	16	70	85	12	N20W13	0	0	0		17	N20W13	Q	SOLQUIET MAGQUIET
						N32E14	0	0	0			N32E14	Q	
						N29E18	0	0	0			N29E18	Q	
						N20E34	0	0	0			N20E34	Q	
						N23E50	0	0	0			N23E50	Q	
230	18	17	50	85	20	N20W26	0	0	0		18	N20W26	Q	SOLQUIET MAGALERT MINOR 18/18
						N27W00	0	0	0			N27W00	Q	
						N23E36	0	0	0			N23E36	Q	
						S27E61	0	0	0			S27E61	Q	
231	19	18	67	86	10	N19W40	0	0	0		19	N19W40	Q	SOLQUIET MAGALERT 19
						N27W13	0	0	0			N27W13	Q	
						N23E24	0	0	0			N23E24	Q	
						S26E47	0	0	0			S26E47	Q	
232	20	19	49	85	18	N18W53	0	0	0		20	N18W53	Q	SOLQUIET MAGNIL
						N27W26	0	0	0			N27W26	Q	
						N22E09	0	0	0			N22E09	Q	
						S26E34	0	0	0			S26E34	Q	

ALERT PERIODS

INTERNATIONAL URSIGRAM
AND WORLD DAYS SERVICE

AUGUST 1977

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	IO cm solar flux	A index	Active Regions				Outstanding events	Forecasts			Alert Situations
						Location Lat-Long	No. of Flares Total	M	X		Date	Location Lat-Long	Desc*	
233	21	20	62	87	08	N19W69	0	0	0		21	N19W69	Q	SOLQUIET MAGQUIET
						N28W41	0	0	0			N28W41	Q	
						N22W04	0	0	0			N22W04	Q	
						N20W26	0	0	0			N20W26	Q	
234	22	21	69	89	07	N19W81	0	0	0		22	N19W81	Q	SOLQUIET MAGQUIET
						N27W52	0	0	0			N27W52	Q	
						N19W40	0	0	0			N19W40	Q	
						S26E64	0	0	0			S26E64	Q	
						S23W47	0	0	0			S23W47	Q	
235	23	22	68	88	05	N19W90	0	0	0		23	N19W90	Q	SOLQUIET MAGQUIET
						N27W64	0	0	0			N27W64	Q	
						N19W52	0	0	0			N19W52	Q	
						S26E45	0	0	0			S26E45	Q	
						S23W60	0	0	0			S23W60	Q	
						S27E20	0	0	0			S27E20	Q	
236	24	23	24	84	08	S25E33	3	0	0		24	S25E33	Q	SOLQUIET MAGQUIET
						S22W73	0	0	0			S22W73	Q	
237	25	24	39	84	12	S26E25	2	0	0		25	S26E25	Q	SOLQUIET MAGALERT 25/26
						N20W40	0	0	0			N20W40	Q	
238	26	25	33	86	17	S25E09	0	0	0		26	S25E09	Q	SOLQUIET MAGALERT MINOR 26
						N21W52	0	0	0			N21W52	Q	
239	27	26	69	85	13	S26W00	4	0	0		27	S26W00	E	SOLQUIET MAGNIL
						N18W70	0	0	0			N18W70	Q	
						N44E16	0	0	0			N44E16	Q	
						N28W21	0	0	0			N28W21	Q	
240	28	27	46	84	15	S26W15	2	0	0		28	S26W15	E	SOLQUIET MAGQUIET
						N27W35	0	0	0			N27W35	Q	
						S31E42	0	0	0			S31E42	Q	
241	29	28	67	81	07	S25W28	3	0	0		29	S25W28	Q	SOLQUIET MAGQUIET
						N27W48	0	0	0			N27W48	Q	
						S30E28	0	0	0			S30E28	Q	
						N38W19	0	0	0			N38W19	Q	
242	30	29	66	84	06	S25W41	1	0	0		30	S25W41	Q	SOLQUIET MAGQUIET
						N27W59	1	0	0			N27W59	Q	
						S20E15	0	0	0			S20E15	Q	
243	31	30	54	84	05	S25W53	2	0	0		31	S25W53	Q	SOLQUIET MAGQUIET
						N28W74	1	0	0			N28W74	Q	
						S30E02	0	0	0			S30E02	Q	
244	01	31	38	83	05	N24E72	0	0	0		01	N24E72	Q	SOLQUIET MAGQUIET
						S30W07	0	0	0			S30W07	Q	
						S25W64	0	0	0			S25W64	Q	

* Q=Quiet E=Eruptive A=Active P=Proton C=Caution D=Doubtful O.G.=Other Groups MF=Major Flare
** EPL = Eruptive prominence on the solar limb.

RELATIVE SUNSPOT NUMBERS

ZURICH, R_Z

	1976 FINAL				1977 PROVISIONAL							
DAY	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
1	17	38	8	0	20	15	0	7	15	44	42	17
2	28	26	0	0	32	19	8	11	14	43	45	15
3	12	38	0	0	25	19	8	10	22	43	42	24
4	11	33	0	0	22	16	8	7	23	45	39	19
5	17	25	0	0	21	18	8	7	16	40	40	23
6	10	24	0	0	13	7	9	8	16	33	40	26
7	9	30	0	7	0	7	5	7	12	41	25	28
8	9	7	0	19	0	26	20	0	19	38	22	25
9	18	14	0	22	0	21	26	0	25	33	17	30
10	22	0	0	19	0	23	19	0	29	29	27	25
11	24	0	0	22	14	25	19	9	34	27	9	23
12	20	13	0	16	19	48	9	12	35	22	8	29
13	18	17	5	12	23	66	8	16	26	20	12	40
14	10	23	0	32	22	61	7	22	33	25	7	48
15	16	25	7	34	20	45	0	34	26	8	0	42
16	14	28	7	36	18	49	0	33	21	8	0	38
17	8	31	14	34	30	44	0	32	20	8	0	36
18	8	24	20	24	26	37	0	29	12	21	0	40
19	7	20	13	15	7	25	0	22	0	38	7	35
20	0	19	12	8	0	10	0	12	11	21	8	30
21	0	15	8	9	15	9	0	20	14	26	8	32
22	0	22	13	9	24	9	10	19	7	40	27	42
23	7	28	11	9	34	9	8	18	7	57	33	15
24	7	30	10	17	35	8	7	8	7	60	45	19
25	16	38	9	22	17	8	14	0	0	74	38	25
26	17	29	9	25	8	8	8	14	7	71	41	34
27	18	24	8	16	0	0	9	9	13	74	34	38
28	18	19	8	17	13	0	16	16	16	65	26	36
29	23	15	8	19	11		8	9	23	50	16	38
30	38	8	0	19	8		8	8	30	45	8	32
31		8		12	10		8		40		7	31
MEAN	13.5	20.6	5.2	15.3	15.7	22.6	8.0	13.2	18.4	38.4	21.2	29.9

1976 yearly mean = 12.6

DAILY SOLAR FLUX AT 2800 MHz
OTTAWA ARO

FLUX ADJUSTED TO 1 A.U., S_a

	1976				1977							
DAY	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
1	76.3	74.6	75.9	70.2	73.8	81.7*	72.6	74.8	77.2	86.9	102.0	83.0*
2	75.3	73.9	69.1	71.6	76.5	82.1	75.4	76.3	78.5	90.9*	100.7	82.8
3	75.7	73.8	69.8	71.2	76.0	80.9	74.8	76.6	81.9	93.0*	97.4	82.3
4	75.9	73.1	69.9	71.3	75.5	78.7	76.9	76.8	81.4*	94.2	94.3	82.9*
5	75.4	74.8	70.9	70.1	74.0	77.8	77.6	75.5	79.6	90.2*	88.0*	86.4
6	73.1	74.7	69.7	70.1	72.4	75.2	77.6	76.1	78.5	90.6	90.2	88.2
7	73.0	74.5	69.5	69.7	71.4	74.6	77.2	75.5*	77.1*	92.0	85.2	86.9
8	72.9	74.6	69.3	70.8	69.6	78.6	81.6	74.3	77.9	91.9*	82.1	85.1
9	73.2	74.8	70.7	74.3	68.4	83.1	80.3	74.8	83.6	90.9	79.0	85.9
10	75.8	74.9	69.4	76.8	68.8	83.9	80.5	76.5	80.8	89.2*	76.9	87.2
11	75.7	73.7	70.5	78.3	71.2	84.6	78.9	79.2	80.8	87.2	76.2	87.6
12	75.7	73.3	70.8	79.6	74.9	86.9*	78.6	80.2	79.7	83.3	75.8	86.5
13	74.3	72.6	69.4	79.1	77.5	88.5	77.9	82.7	81.5	84.2	77.8	89.0
14	74.7	74.4	69.2	81.3	74.5	85.2	77.2	83.4	84.8	82.3	76.8	87.5
15	73.9	75.5	71.1	79.8	75.6	84.4	74.8	86.8	85.0	82.3	76.0	86.9
16	75.8	77.3	71.1	77.8	77.5	85.7	74.1	83.7	85.1	81.4	76.9	87.3
17	76.5	78.0	72.8	75.5	76.1	89.6*	74.1	83.6	84.1	82.4	76.5	87.1
18	74.3	77.3	75.6	73.8	75.4	86.5	73.9	80.6	82.9	84.3	76.9	88.6
19	73.3	76.6*	74.6*	72.9	76.9	82.8	74.0	79.8*	82.1	85.2	76.9	87.0
20	72.2	75.9	72.9	71.7	75.2	81.1	72.3	80.4*	81.3	88.9	83.1	88.7
21	73.9	73.5	73.2	71.8	74.0	78.6	72.8	80.8	81.4	92.4	81.7	90.8
22	78.5	75.4	73.3	73.4	76.8	75.9	74.6	80.1	82.9	98.8*	83.1	89.6
23	72.8	80.1	72.5	73.7	78.7	75.9	74.7	77.5	82.4	99.4	85.8	86.3
24	72.5	80.1	72.9	74.2	77.4	74.2	74.8	76.5	79.2	107.4	84.0	86.8
25	73.4	84.7	72.7	73.6	74.9	74.3	74.8	76.4	77.4	113.8	86.8	87.7
26	72.8	86.4	72.1	75.6	76.8	72.3	75.1	75.4	76.8	120.7	86.8	86.4
27	73.3	77.4	73.7	75.2	75.3	72.8	74.5	74.9	77.9	115.9*	85.4	85.4
28	73.6	73.9	71.7	74.5	77.1	72.8	74.4	74.2	79.1	113.4	87.5	82.4
29	71.5	72.1	69.7	74.8	76.1		75.4	74.8	81.7	111.9	86.7	86.1
30	72.6	72.1	69.7	75.1	76.3		74.6	76.6	89.9	108.9	84.1	85.5
31		78.4		76.4	79.6		74.1		92.8		93.4	84.7
MEAN	73.9	75.4	71.3	74.3	74.9	80.2	75.8	78.2	81.4	94.5	83.7	86.4

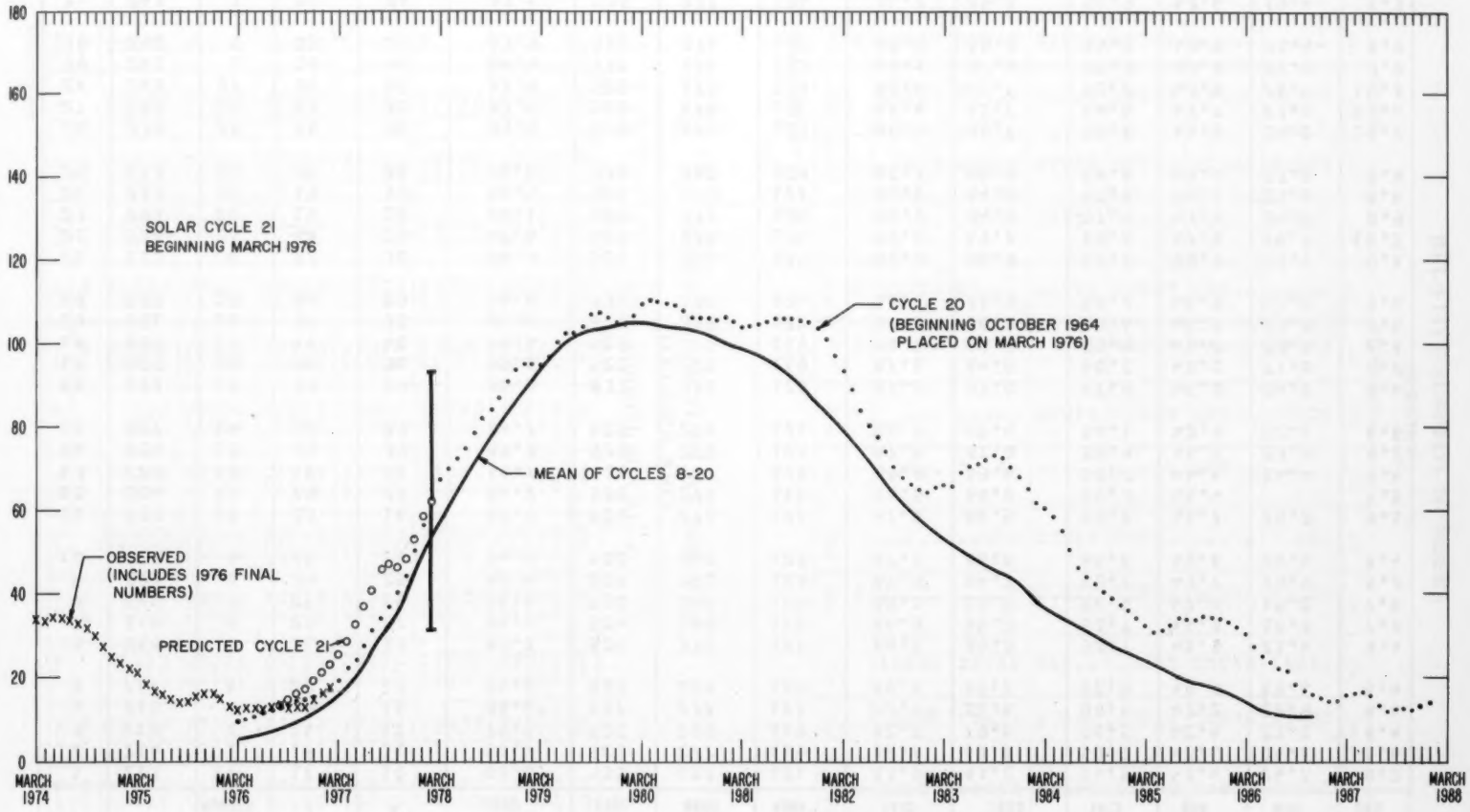
* adjusted for burst

DAILY SOLAR INDICES

AUGUST 1977

AUG 1977	YEAR DAY	BARTELS 27-DAY CYCLE NUMBER	SUNSPOT NUMBERS		OBSERVED FLUX OTTAWA 2800	SOLAR FLUX ADJUSTED TO 1 A.U.								
			R_Z	$R_{A'}$		AFGL 15400	AFGL 8800	AFGL 4995	OTTAWA 2800	AFGL 2695	AFGL 1415	AFGL 606	AFGL 410	AFGL 245
1	213	27	17	10	80.6*	533	273	121	83.0*	81.2	54.5	43.4	24.7	8.2
2	214	1	15	11	80.4	522	277	119	82.8	80.5	50.9	43.1	24.8	8.6
3	215	2	24	17	79.9	523	269	119	82.3	79.6	51.5	42.6	23.0	8.4
4	216	3	19	16	80.6*	537	276	122	82.9*	82.8	50.4	42.2	22.9	8.4
5	217	4	23	23	84.0	532	278	129	86.4	85.5	52.9	40.8	19.1	8.4
6	218	5	26	28	85.7	526	272	126	88.2	86.3	53.7	41.9	21.4	9.4
7	219	6	28	27	84.5	524	269	125	86.9	85.2	53.7	41.3	18.7	7.8
8	220	7	25	26	82.8	520	268	120	85.1	83.0	50.4	40.9	19.2	7.5
9	221	8	30	25	83.6	527	271	123	85.9	84.7	52.0	43.7	19.4	8.2
10	222	9	25	26	84.9	533	283	123	87.2	86.0	55.0	42.8	20.6	8.4
11	223	10	23	16	85.3	521	278	122	87.6	86.5	52.6	46.2	20.7	9.1
12	224	11	29	21	84.2	536	275	119	86.5	86.0	56.3	44.4		7.5
13	225	12	40	32	86.7	528	277	120	89.0	89.6	58.7	44.4	24.4	9.4
14	226	13	40	39	85.3	529	272	123	87.5	87.0	59.9	44.6	23.9	9.2
15	227	14	42	39	84.7	525	275	121	86.9	85.4	54.1	43.9	22.1	8.6
16	228	15	38	39	85.2	532	280	123	87.3	87.0	57.9	45.3	24.2	8.4
17	229	16	36	36	85.0	522	275	119	87.1	84.6	60.0	46.1	21.8	9.2
18	230	17	40	40	86.4	522	275	119	88.6	86.3	59.6	46.7	23.3	8.8
19	231	18	35	32	85.0	528	283	122	87.0	86.2	58.4	44.5	23.8	8.6
20	232	19	30	29	86.6	535	286	124	88.7	88.9	58.8	46.9	23.8	9.6
21	233	20	32	30	88.8	527	283	129	90.8	90.3	57.5	50.9	23.4	9.8
22	234	21	42	29	87.6	525	279	126	89.6	89.2	59.8	47.5	25.7	10.2
23	235	22	15	12	84.1	525	272	120	86.0	84.6	57.6	47.0	24.7	8.9
24	236	23	19	13	84.1	524	273	122	86.0	84.6	57.8	46.2	20.6	8.6
25	237	24	25	26	85.8	536	285	125	87.7	86.5	54.0	45.4	23.6	8.9
26	238	25	34	34	84.6	539	279	123	86.4	88.7	55.6	44.9	24.0	10.2
27	239	26	38	35	83.6	526	279	121	85.4	83.7	54.6	43.7	23.4	11.4
28	240	27	36	35	80.8	525	273	119	82.4	82.7	52.2	42.8	21.5	11.3
29	241	1	38	45	84.4	527	276	123	86.1	87.6	55.0	43.0	22.5	9.2
30	242	2	32	37	83.9	522	276	122	85.5	86.3	54.8	42.8	21.4	8.9
31	243	3	31	28	83.1	528	277	124	84.7	85.8	54.9	42.6	19.4	8.3
MEAN			29.9	27.6	84.3	528	276	122	86.4	85.5	55.3	44.3	22.4	8.9

* Adjusted for burst.



PREDICTED AND OBSERVED SUNSPOT NUMBERS

SMOOTHED OBSERVED AND PREDICTED SUNSPOT NUMBERS
CYCLE 21

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1976	15.2	13.2	12.2	12.6	12.5	12.2	12.9	13.9	14.1	13.3	13.3	14.7
1977	16.6	17.9	20.2	22.9	26.2	29.7	33.1	36.6	40.1	44.2	48.6	53.2
			(1)	(3)	(5)	(7)	(9)	(12)	(15)	(19)	(21)	(24)
1978	57.6	62.7	67.4	71.1	74.4	77.6	80.9	84.9	89.7	93.7	97.4	100.8
	(27)	(31)	(33)	(36)	(40)	(42)	(43)	(43)	(43)	(44)	(44)	(46)
1979	103.8	106.3	109.4	112.9	115.4	117.0	117.8	118.2	117.9	117.5	117.3	117.4
	(45)	(46)	(49)	(50)	(51)	(53)	(55)	(57)	(59)	(59)	(58)	(57)
1980	117.8	117.3	115.8	114.3	113.1	112.5	112.1	111.4	111.2	111.3	110.7	109.0
	(58)	(59)	(58)	(58)	(57)	(56)	(56)	(57)	(57)	(58)	(58)	(56)
1981	107.1	105.9	104.8	104.2	103.9	103.4	102.5	100.9	98.7	96.1	93.4	91.0
	(55)	(53)	(52)	(50)	(48)	(47)	(46)	(44)	(42)	(40)	(39)	(39)
1982	89.2	87.2	84.8	81.5	78.0	75.1	71.9	69.4	66.5	63.4	61.2	59.8
	(37)	(34)	(33)	(32)	(30)	(28)	(25)	(23)	(23)	(22)	(21)	(22)
1983	58.4	56.7	54.8	53.4	52.2	50.8	49.5	48.4	47.5	46.4	44.9	42.7
	(22)	(21)	(22)	(23)	(24)	(26)	(27)	(28)	(29)	(29)	(28)	(27)
1984	40.1	38.0	36.7	35.5	34.0	32.7	31.6	30.6	29.3	28.1	27.0	26.0
	(27)	(28)	(30)	(30)	(30)	(29)	(27)	(26)	(26)	(26)	(25)	(25)
1985	25.4	24.6	23.6	22.6	21.8	21.0	20.1	19.0	18.4	18.2	17.8	17.1
	(25)	(25)	(23)	(22)	(21)	(21)	(22)	(23)	(23)	(23)	(23)	(22)
1986	16.2	15.2	14.3	13.4	12.6	12.2	11.9	11.7	11.5	11.4	11.5	11.8
	(21)	(20)	(19)	(18)	(17)	(16)	(15)	(14)	(12)	(11)	(11)	(11)
1987	12.4	13.1	13.8	14.6	15.5							
	(11)	(12)	(13)	(14)	(15)							

For each month, the upper figure is the observed or predicted Zürich smoothed sunspot number. The lower figure in parenthesis is the corresponding absolute value of the 90% prediction interval, an indication of the uncertainty above and below the predicted number. Observed numbers are those with no prediction intervals. The observed smoothed sunspot numbers are based on final Zürich numbers through 1976.

The predicted sunspot numbers are derived from a regression analysis based on cycles 8 through 20. Tests indicate that earlier cycles are from a different statistical population.

Hα SOLAR FLARES

AUGUST 1977

OBSERV-ATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE AUG	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY	MIN.		COORD.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
HITK	01	0058	0101	0103	N28	W40	.786		29.0	5	SN		P	0101	80	1.2	D
HITK	01	0137		0148	N28	W38	.770		29.2	11	SN		P	0137	50	.7	D
HTPR	01	0918	0923	0935	N23	E00	.493		1.4	17	SF		C	0923	90	1.0	
HTPR	01	1011	1013	1017	N25	E02	.524		1.6	6	SF		C	1013	50	.5	
HTPR	01	1031	1033	1040	N25	E01	.523		1.5	9	SF		C	1033	50	.5	
HTPR	01	1417	1422	1445	N26	E02	.539		1.7	28	SN		C	1422	130	1.4	
HTPR	01	1539	1544	1550	N27	E00	.553		1.7	11	SF		C	1544	140	1.5	
HTPR	01	1641	1644	1655	N27	E00	.553		1.7	14	SF		C	1644	90	1.0	H
CATA	03	1030	1035	1055	N21	E77	.986	14888	9.2	25	1N	2		1035	56		
CATA	03	1450	1455	1500	N18	W01	.414		3.5	10	SN	2		1455	28	.3	
MCMA	04	1231E		1242D	N26	E68	.958	14888	9.6	11D	SN		P	1231	25	.7	D
MCMA	04	1457E		1515D	N26	E67	.954	14888	9.6	18D	SB		P	1457	30	.8	D
MCMA	04	1558	1602	1609	N26	E67	.954	14888	9.7	11	SN		C	1602	20	.6	D
MCMA	04	1825E		1843D	N02	E64	.902	14888	9.6	18D	SN		C	1832	40	1.0	E
PALE	04	2054	2055	2116	N27	E57	.902		9.1	22	SN	3	C		45		DE
PALE	04	2209E	2210	2216D	N26	E59	.911		9.3	7D	SF	3	C		32		
PALE	04	2226E	2226U	2236D	N26	E59	.911		9.4	10D	SF	3	C		30		
CATA	05	1115	1135	1200	N27	E53	.876		9.4	45	SB	2		1135	84	1.5	T
RAMY	05	1140E	1142	1145D	N28	E51	.866		9.3	5D	SN	4	C		32		
MCMA	05	1146E	1147	1155D	N26	E53	.872	14888	9.5	9D	SN		P	1147	40	.7	E
MCMA	05	1410E		1436D	N26	E51	.858	14888	9.4	26D	1B		C	1418	150	2.7	E
CATA	05	1415	1435	1515	N27	E51	.862	14888	9.4	60	1B	2		1435	140	2.4	
MCMA	05	1726E		1729D	N20	W22	.560	14880	4.1	3D	SF		C	1726	30	.3	E
MCMA	05	1809E	1811	1813D	N26	E50	.851	14888	9.5	4D	SN		C	1811	25	.4	D
MCMA	05	1858	1910	1945D	N27	E48	.840	14888	9.4	47D	1N		C	1910	125	2.1	E
PALE	06	0325E	0325U	0325D	N26	E43	.796		9.4		SF	3	C		27		
TEHR	07	1322E	1327	1333D	N24	E25	.627		9.4	11D	SF	2	V		159		
TEHR	07	1322E	1327	1344	N24	E25	.627		9.4	22D	SF	2	C		159		
RAMY	07	1325E	1328	1345	N26	E24	.639		9.4	20D	SF	4	C		180		
CATA	08	1230	1230	1320	N26	E12	.562		9.4	50	SN	2		1230	28	.3	
CATA	09	1015	1015	1020	N26	E02	.532		9.6	5	SB	2		1015	28	.3	
CATA	09	1420	1425	1445	N27	W01	.546		9.5	25	SN	2		1425	112	1.2	
MCMA	09	1431E		1441D	N27	W00	.546	14888	9.6	10D	SN		P	1435	40	.4	E
MCMA	09	1650E		1710D	N27	W01	.546	14888	9.6	20D	SN		P	1653	40	.4	EH
MCMA	09	1704E		1714D	S22	E43	.700	14893	12.9	10D	SN		P	1710	20	.2	E
MCMA	10	1731E	1732	1745D	N23	W16	.544	14888	9.5	14D	SF		C	1732	20	.2	E
HTPR	10	1731	1733	1745	N25	W16	.569		9.5	14	SN		C	1733	50	.5	
CATA	11	0710E	0740	0805D	S28	E73	.952	14897	16.8	55D	1F	2		0740	112		
HTPR	11	0746	0753	0810	N26	W23	.629		9.6	24	SF		C	0753	40	.5	
HTPR	12	0715	0718	0725	N26	W36	.734		9.6	10	SN		C	0718	60	.8	E
HTPR	12	0813	0817	0825	N26	W37	.743		9.6	12	SF		C	0817	60	.8	E
CATA	12	1340E	1350	1400	N28	E75	.984		18.2	20D	SN	2		1350	56		
CATA	13	1155	1155	1215	N31	W52	.881		9.6	20	SN	2		1155	84	1.5	
CATA	14	0945E	0945	1000D	N20	E18	.518		15.8	15D	SN	2		0945	84	.9	
CATA	15	0605E	0605	0620	N30	E40	.792		18.3	15D	SN	2		0605	28	.4	
MCMA	15	1339	1340	1350D	N30	E32	.732	14899	18.0	11D	SN		C	1340	30	.4	D
MCMA	15	1554E	1554	1557	N30	E32	.732	14899	18.1	3D	SB		C	1554	30	.4	D
CATA	16	1405	1420	1445	N20	W09	.455		15.9	40	SN	2		1420	56	.6	
HTPR	16	1407	1414	1422D	N21	W09	.469		15.9	15D	SF		C	1414	75	.8	
BUCA	17	0736		0745	N31	E14	.627		18.4	9	SF		P	0736	64	.8	
HTPR	17	1226E		1227D	N28	E10	.571		18.3	1D	SF		C	1227	100	1.1	
MCMA	17	1511	1513	1520	N22	W20	.555	14898	16.1	9	SF		C	1513	20	.2	D
MCMA	17	1815E	1816	1843	N26	E07	.533	14899	18.3	28D	SN		C	1816	45	.5	E
MCMA	19	1305E		1400D	N29	W18	.621	14899	18.2	55D	SN		C	1320	125	1.3	EFU
CATA	19	1310E	1320	1330D	N31	W15	.630	14899	18.4	20D	1B	2		1320	196	2.3	
HTPR	19	1320E		1344D	N29	W13	.595		18.6	24D	SN		C	1320	400	4.4	E

Hα SOLAR FLARES

AUGUST 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION — MIN.	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE AUG	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY			COND.	TYPE	TIME — UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
CATA	20	1340	1355	1455D	N17	W64	.920		15.8	75D	SN	2		1355	56	1.3	
CATA	20	1500E	1515	1600D	N20	W64	.925		15.8	60D	SB	2		1600	56	1.3	D
PALE	20	1741	1743	1746	N19	W65	.930		15.9	5	SF	3	V		88		F
PALE	20	1950	1951	1952	N19	W65	.930		16.0	2	SF	3	V		23		DE
CATA	22	1205	1205	1215	N20	W90	1.000		15.8	10	SF	2		1205	28		
MCMA	22	2056		2058D	N28	W63	.934	14899	18.1	2D	SN		P	2058	25	.6	E
CATA	23	0655	0700	0725	S21	W63	.891	14902	18.6	30	1N	2		0700	112		
HTPR	23	1508		1512D	N22	W37	.709		20.9	4D	SF		C	1509	60	.8	D
PALE	23	2100	2102	2108	S25	E41	.696		27.0	8	SF	3	V		48		DE
PALE	23	2100	2102	2108	S25	E41	.696		27.0	8	SF	3	C		48		DE
PALE	23	2117	2120	2123	S25	E41	.696		27.0	6	SF	3	V		31		DE
PALE	23	2117	2120	2123	S25	E41	.696		27.0	6	SF	3	C		31		DE
PALE	23	2147	2149	2156	S25	E41	.696		27.0	9	SF	3	C		25		DE
PALE	23	2147	2149	2156	S25	E41	.696		27.0	9	SF	3	V		25		DE
PALE	24	0155	0155	0159	S25	E39	.675		27.0	4	SF	3	C		29		
HTPR	24	0547	0600	0610	S26	E34	.626		26.8	23	SN		C	0600	300	4.2	E
CATA	24	0605E	0605	0630D	S27	E34	.633		26.8	25D	SB	2		0605	112	1.7	T
HTPR	24	0555		0635	S22	W90	.999		17.5	40	SN		C				A
HTPR	24	1204	1210	1230	N23	W50	.831		20.8	26	SF		C	1210	40	.6	
MCMA	24	1204		1207D	N24	W50	.835	14903	20.8	3D	SN		P	1206	30	.5	E
MCMA	24	1326	1327	1334	N21	W36	.692	14908	21.9	8	SN		C	1327	25	.3	D
HTPR	25	0551	0555	0615	N22	W45	.783		21.9	24	SF		C	0555	70	1.0	D
HTPR	25	0639	0646	0715	N22	W46	.792		21.8	36	SN		C	0646	140	1.9	E
CATA	25	0915	0915	0925	S26	E15	.433		26.5	10	SN	2		0915	112	1.4	
HTPR	25	1002	1003	1014	S27	E18	.471		26.8	12	SN		C	1003	50	.6	D
CATA	25	1005	1005	1035	S27	E18	.471		26.8	30	SN	2		1005	28	.4	
CATA	25	1005	1005	1015	S27	E18	.471		26.8	10	SN	2		1005	28	.4	
HTPR	25	1025	1031	1100	S28	E16	.466		26.6	35	SN		C	1031	60	1.1	E
CATA	25	1035	1035	1055	S29	E14	.464		26.5	20	SN	2		1035	28	.4	
MCMA	25	1554	1557	1615	S28	E18	.483	14915	27.0	21	SN		C	1557	25	.3	DH
MCMA	25	1626	1628	1631	S28	E18	.483	14915	27.0	5	SN		C	1628	25	.3	DH
MCMA	25	1839E		1840D	S28	E17	.474	14915	27.1	1D	SF		P	1839	20	.2	D
CATA	26	0630	0635	0640D	S27	E09	.406		26.9	10D	SN	2		0635	56	.7	
HTPR	26	0635E		0640	S28	E12	.438		27.2	5D	SN		C	0635	100	1.2	DH
MCMA	26	1312E		1415	S27	E06	.392	14915	27.0	63D	SF		C	1321	40	.4	EHX
MCMA	26	1645	1646	1649	S28	E06	.407	14915	27.1	4	SN		C	1646	25	.3	D
MCMA	26	1704E		1709	S28	E03	.399	14915	26.9	5D	SN		C	1704	25	.3	D
MCMA	26	1806	1811	1820	S26	E04	.369	14915	27.1	14	SN		C	1811	35	.4	E
MCMA	26	1952	1954	2004	S26	E03	.367	14915	27.1	12	SN		C	1954	60	.7	E
CATA	27	0955	1000	1015	N27	W28	.664		25.3	20	SN	2		1000	28	.3	
CATA	27	1105	1105	1125	S26	W10	.398	14915	26.7	20	1B	2		1105	337	4.2	
CATA	29	0735	0740	0740D	S24	W35	.629		26.7	5D	SB	2		0740	73	1.1	
CATA	30	0750E	0755	0830D	S27	W38	.679		27.5	40D	SN	2		0755	56	.9	
CATA	30	1435	1440	1440D	N24	E90	1.000	14930	7.4	5D	1F	2		1440	56		
MCMA	30	1730E	1733	1740D	N25	E90	1.000	14930	7.5	10D	SF		C	1733			
CATA	31	0820	0830	0830D	N24	E90	1.000		8.1	10D	SF	2		0830	28		
HTPR	31	1004	1010	1014D	N25	E80	.992		7.4	10D	SN		C				AE
CATA	31	1010	1015	1105	N27	E85	.999	14930	7.8	55	3B	2		1015	393		

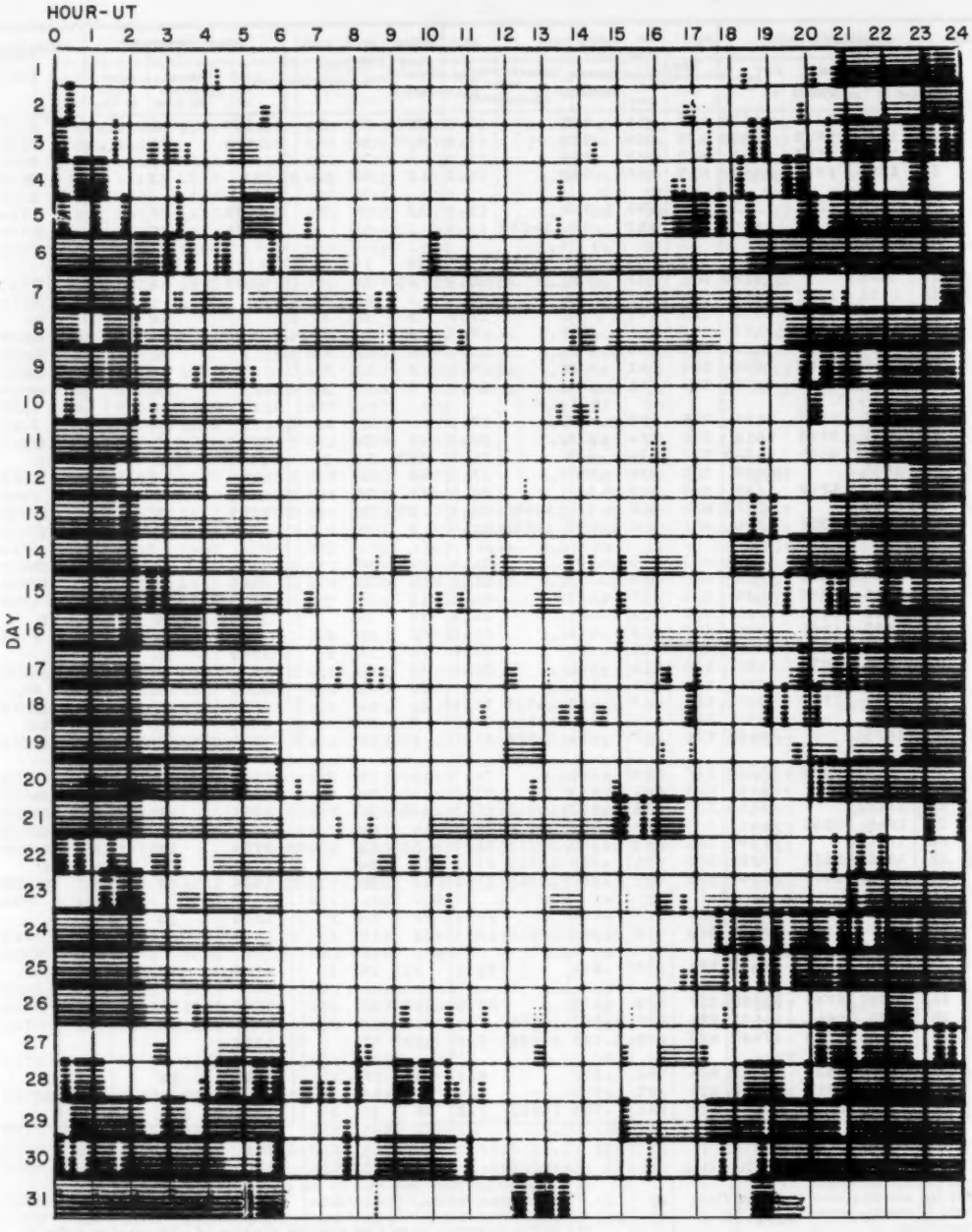
"Remarks":

A = Eruptive prominence whose base is less than 90° from central meridian.
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No visible spots in the neighborhood.
H = Flare accompanied by a high speed dark filament.
I = Active region very extended.
J = Distinct variations of plage intensity before or after the flare.
K = Several intensity maxima.
L = Existing filaments show signs of sudden activity.
M = White-light flare.
N = Continuous spectrum shows effects of polarization.
O = Observations have been made in the calcium II lines H and K.
P = Flare shows helium D_3 in emission.
Q = Flare shows the Balmer continuum in emission.
R = Marked asymmetry in Hα line suggests ejection of high velocity material.
S = Brightness follows disappearance of filament (same position).
T = Region active all day.
U = Two bright branches, parallel (||) or converging (Y).
V = Occurrence of an explosive phase: important and abrupt expansion in about a minute with or without important intensity increase.
W = Great increase in area after time of maximum intensity.
X = Unusually wide Hα line.
Y = System of loop-type prominences.
Z = Major sunspot umbra covered by flare.

INTERVALS OF NO FLARE PATROL OBSERVATION

FOR PRECEDING SOLAR FLARE TABLE

AUGUST 1977



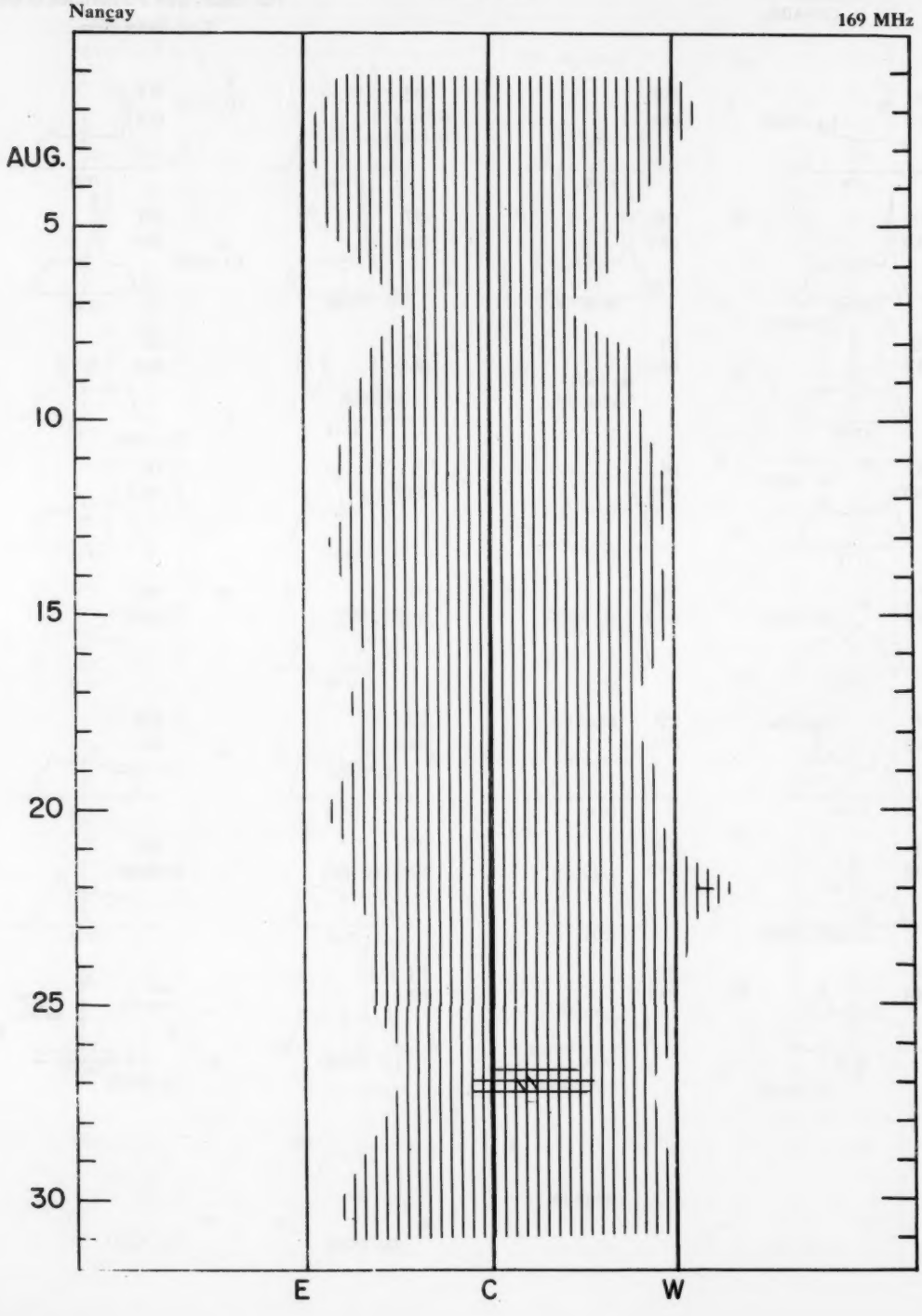
Observatories included in total patrol:

Bucharest	Herstmonceux	McMath-Hulbert	Palehua	Tehran	Wendelstein
Catania	Kandilli	Mitaka	Ramey	Upice	
Haute Provence	Kodaikanal				

Times of no flare patrol are shown by the shaded area for each day divided into times of no cinematographic patrol (bottom half of day) and times of neither visual nor cinematographic patrol (top half of day).

SOLAR RADIO EMISSION
INTERFEROMETRIC OBSERVATION

AUGUST 1977

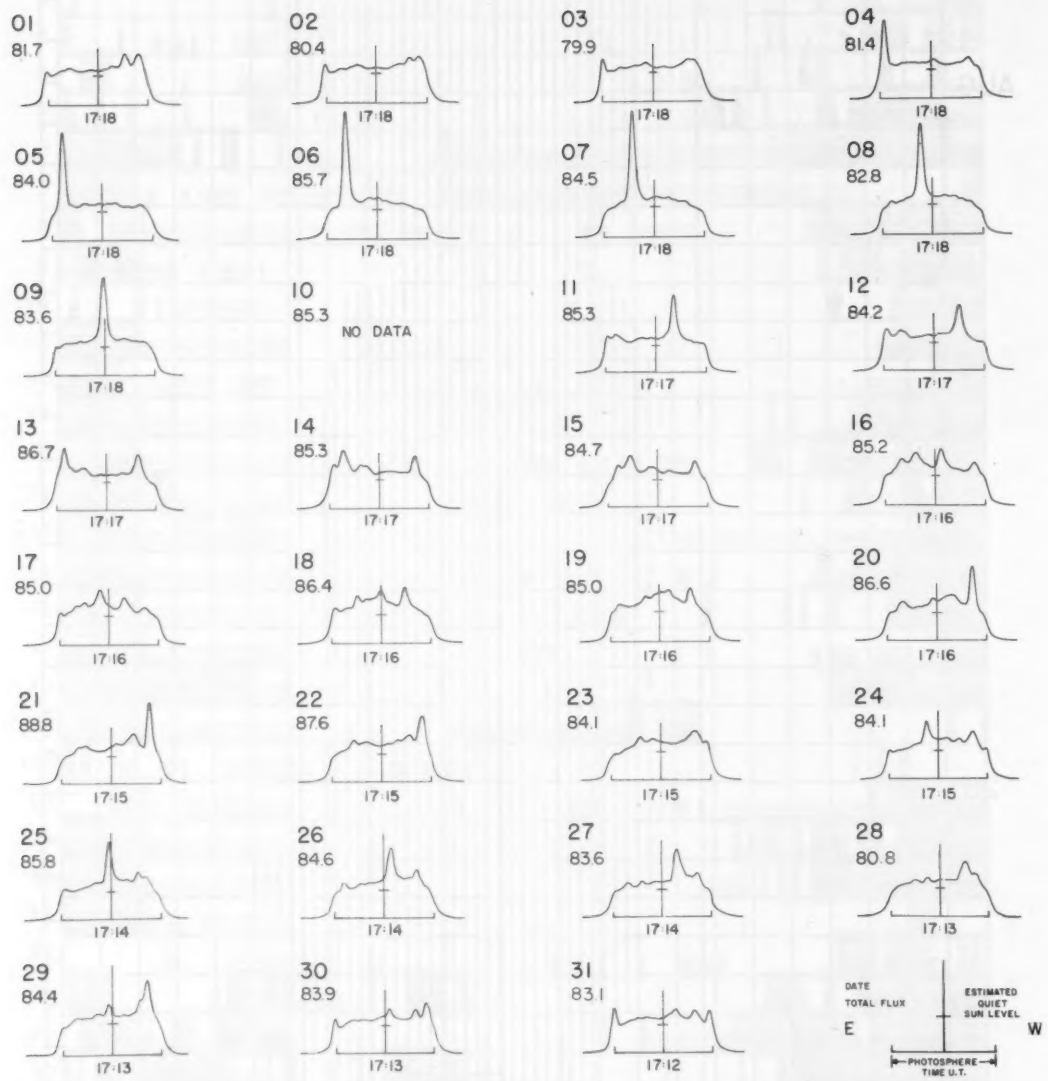


EAST-WEST SOLAR SCANS

AUGUST 1977

ALGONQUIN RADIO OBSERVATORY
CANADA

10·7cm
Fan Beam with 1·5 minutes of arc
E-W Resolution



EAST-WEST SOLAR SCANS

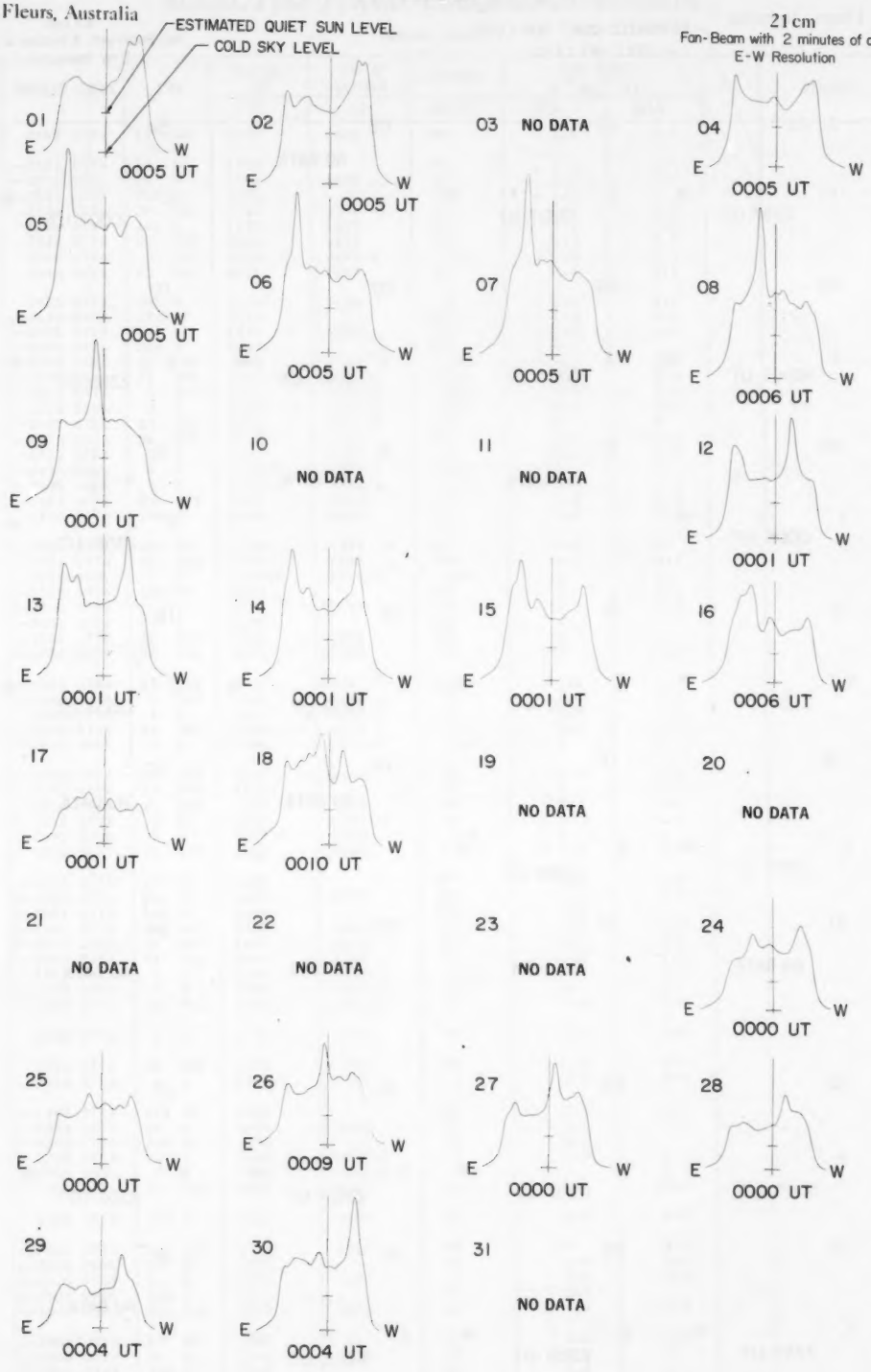
AUGUST 1977

Fleurs, Australia

ESTIMATED QUIET SUN LEVEL

COLD SKY LEVEL

21 cm
Fan-Beam with 2 minutes of arc
E-W Resolution



EAST-WEST SOLAR SCANS

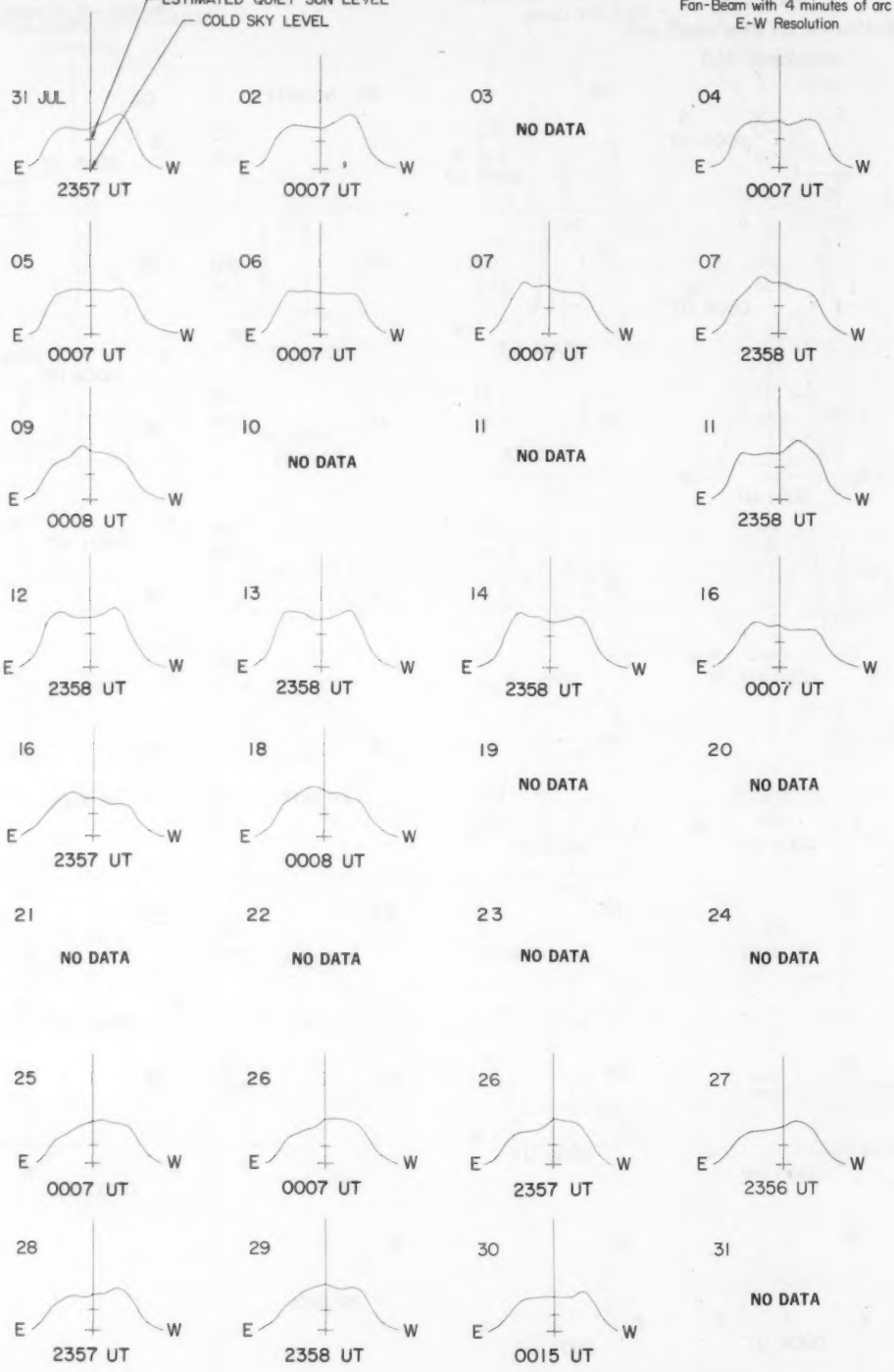
AUGUST 1977

Fleurs, Australia

ESTIMATED QUIET SUN LEVEL

COLD SKY LEVEL

43 cm
Fan-Beam with 4 minutes of arc
E-W Resolution



SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

AUGUST 1977

	FREQUENCY	STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1}		INT	REMARKS	
				UT	UT	MINUTES	PEAK	MEAN			
1	2800	OTTA	20 GRF	1455	1620	255	1.4	0.7			
4	2800	OTTA	27 RF	1450		170	1.2	0.9			
	2800	OTTA	24 R	1450	1530	40	1.2	0.8			
	2800	OTTA	24P R	1530		90	1.2				
	2800	OTTA	26 FAL	1700	1740	40	-1.2	-0.6			
	2800	OTTA	240 R	1755	1805	10	1.2	0.6			
	2800	OTTA	20 GRF	1825	1835	60	1.2	0.6			
	2800	OTTA	2 S/F	2054	2054.5	1.5	1.6	0.8			
	2800	OTTA	22 GRF	2056	2125	80	3.8	2.1			
5	2800	OTTA	240 R	1127	1136	9	1.4	0.7			
	2800	OTTA	27AFRF	1230		295	2.8	2.2			
	2800	OTTA	24 R	1230	1300	30	2.8	1.4			
	2800	OTTA	24P R	1300		165	2.8				
	2800	OTTA	21 GRF	1412	1423	78	4.6	2.3			
	2695	SGMR	20 GRF	1412.9	1413.5	22.5	7.5	2.3		SWF	1
	2800	OTTA	2 S/F	1413	1413.2	4.5	6.8	3.1			
	8800	SGMR	3 S	1413	1413.3	9.2	10.4	3.1		SWF	1
	2695	BCUL	23 GRF	1414	1414.5	15	6	3			
	2800	OTTA	26 FAL	1545	1725	100	-2.8	-1.4			
	2800	OTTA	3 S	1857	1900	6	20.4	5.1			
	2695	BOUL	1 S	1858.5	1900.1	11.5	18	6			
	2695	SGMR	3 S	1858.6	1900.1	4.3	24.8	7.4			2
	2800	OTTA	29 PBI	1903	1903	77	4.2	2.3			
	2800	OTTA	240 R	2030	2045	15	0.8	0.4			
6	2800	OTTA	26 FAL	1100	1307	127	-9.6	-6			
	2800	OTTA	32 ABS	1535	1555	68	-4.2	-2.1			
	2695	BCUL	3 S	1744.5	1745.5	2.5	2	1			
	2800	OTTA	27AFRF	2033		197	3	2.2			
	2800	OTTA	24 R	2033	2145	72	3	1.5			
	2800	OTTA	24P R	2145		108	3				
	2800	OTTA	20 GRF	2249	2251	30	2	1			
	2800	OTTA	26 FAL	2333	2350	17	-3	-1.5			
7	2800	OTTA	21 GRF	1300	1315	110	4.6	2.3			
	2800	OTTA	2 S/F	1304	1305.1	8	4.4	2.2			
	2800	OTTA	1 S	1633	1635.2	10	1.2	0.4			
	2800	OTTA	20 GRF	1705	1730	45	0.8	0.4			
	2695	BOUL	3 S	1744	1745.5	2.5	3	1			
8	2800	OTTA	20 GRF	2015	2023	30	1.8	0.9			
	2800	OTTA	20 GRF	2105		40	1	0.7			
	2800	OTTA	21 GRF	2150	2210	35	1.2	0.6			
	2800	OTTA	1 S	2207	2207.5	2	3	1.2			
	2695	BCUL	8 S	2207.5	2208	1.5	4	1			
	2695	PENT	22 GRF	2252	2254	24	1.4	0.7			
9	2800	OTTA	27A RF	1415		175	1.2	1.1			
	2800	OTTA	24 R	1415	1425	10	1.2	0.6			
	2800	OTTA	24P R	1425		153	1.2				
	2800	OTTA	20 GRF	1535	1541	23	1.6	0.8			
	2800	OTTA	20 GRF	1625	1631	15	1.4	0.7			
	2800	OTTA	26 FAL	1658	1710	12	-1.2	-0.6			
	2800	OTTA	1 S	2245	2246.9	2.5	6.6	3.3			
	2695	BCUL	3 S	2246	2247.5	2.5	6	2			
	2800	OTTA	29 PBI	2247.5	2247.5	37	2.4	1.2			
10	2800	OTTA	1 S	1730	1731	8	1.4	0.5			
12	2800	OTTA	20 GRF	1520	1550	60	1.2	0.6			
	2800	OTTA	1 S	1728.5	1729	3	0.8	0.4			
15	2800	OTTA	27A RF	1430		100	0.8	0.7			
	2800	OTTA	24 R	1430	1455	25	0.8	0.4			
	2800	OTTA	24P R	1455		65	0.8				
	2800	OTTA	1 S	1552	1552.5	2	2.2	1			
	2695	BCUL	1 S	1552.5	1553.5	1.5	3	1			
	2800	OTTA	26 FAL	1600	1610	10	-0.8	-0.4			
17	2800	OTTA	240 R	2135	2155	20	1.4	0.7			
18	2800	OTTA	20 GRF	1300	1317	50	08	0.4			
	2695	PENT	27 RF	2225		95	0.8	0.6			
	2695	PENT	24 R	2225	2235	10	0.8	0.4			
	2695	PENT	24P R	2235		55	0.8				
	2695	PENT	26 FAL	2330	2400	30	-0.8	-0.4			
19	2800	OTTA	27 RF	1255		190	1.6	1.4			
	2800	OTTA	24 R	1255	1330	35	1.6	1			
	2800	OTTA	24P R	1330		120	1.6				
	2800	OTTA	26 FAL	1520	1605	45	-1.6	-0.8			
21	2800	OTTA	20 GRF	1208	1214	12	1.4	0.7			

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

AUGUST 1977

	FREQUENCY	STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1}		INT	REMARKS
				UT	UT	MINUTES	PEAK	MEAN		
	2800	OTTA	27A RF	1420		305	2.4	1.8		
	2800	OTTA	24 R	1420	1600	100	2.4	1.2		
	2800	OTTA	1A S	1555	1556	4	1	0.5		
	2800	OTTA	8 S	1557.5	1557.7	0.5	3.2	1.6		
	2800	OTTA	24P R	1600		135	2.4			
	2800	OTTA	26 FAL	1815	1925	70	-2.4	-1.2		
	2800	OTTA	240 R	1930	2000	30	1.4	0.7		
	2800	OTTA	20 GRF	2030	2340	300	2.8	1.8		
22	2695	PENT	20 GRF	2250	2430	180 D	3.8			
23	2695	BOUL	45 C	2300	2301.5	4	32	11		
	2695	BOUL	2 SF	2330	2330.5	2.5	4	1		
	2695	BOUL	8 S	2334	2335	1.5	7	2		
25	2800	OTTA	20 GRF	1830	1845	50	1	0.5		
26	2800	OTTA	240 R	1435	1530	55	1.2	0.6		
	2800	OTTA	1 S	1721	1722.2	2	1.2	0.6		
	2695	SGMR	3 S	1948.8	1953.4	6.3	15.7	7.9		3
	2800	OTTA	45 C	1952	1953.3	4	18.8	2.6		
	2695	BOUL	45 C	1953.5	1954.5	1.5	15	5		
	2800	OTTA	20 GRF	2015	2136	120	2.2	0.8		
27	2695	SGMR	4 S/F	1059.8	1102.2	4.1	38.3	11.5		SWF 2
	8800	SGMR	4 S/F	1101.3	1102.4	2.7	43.7	13.1		SWF 2
28	2800	OTTA	240 R	2010	2100	50	1.4	0.7		

Observatories:

BOUL = Boulder MANI = Manila OTTA = Ottawa ARO PENT = Penticton SGMR = Sagamore Hill

Explanation of Type Code:

1 Simple 1
2 Simple 1F
3 Simple 2
4 Simple 2F
5 Simple
6 Minor
7 Minor +
8 Spike
20 Simple 3
21 Simple 3A
22 Simple 3F
23 Simple 3AF
24 Rise
25 Rise A
26 Fall
27 Rise and Fall
28 Precursor
29 Post Burst Increase
30 Post Burst Increase A
31 Post Burst Decrease
32 Absorption
40 Fluctuation
41 Group of Bursts
42 Series of Bursts
43 Onset of Noise Storm
44 Noise Storm in Progress
45 Complex
46 Complex F
47 Great Burst
48 Major
49 Major +

CORONAL HOLES

Helium D3 Chromosphere at Solar Limb

AUGUST 1977

Big Bear Solar Observatory

Only three D3 limb scans were made during August. These data are presented in numerical form rather than graphically.

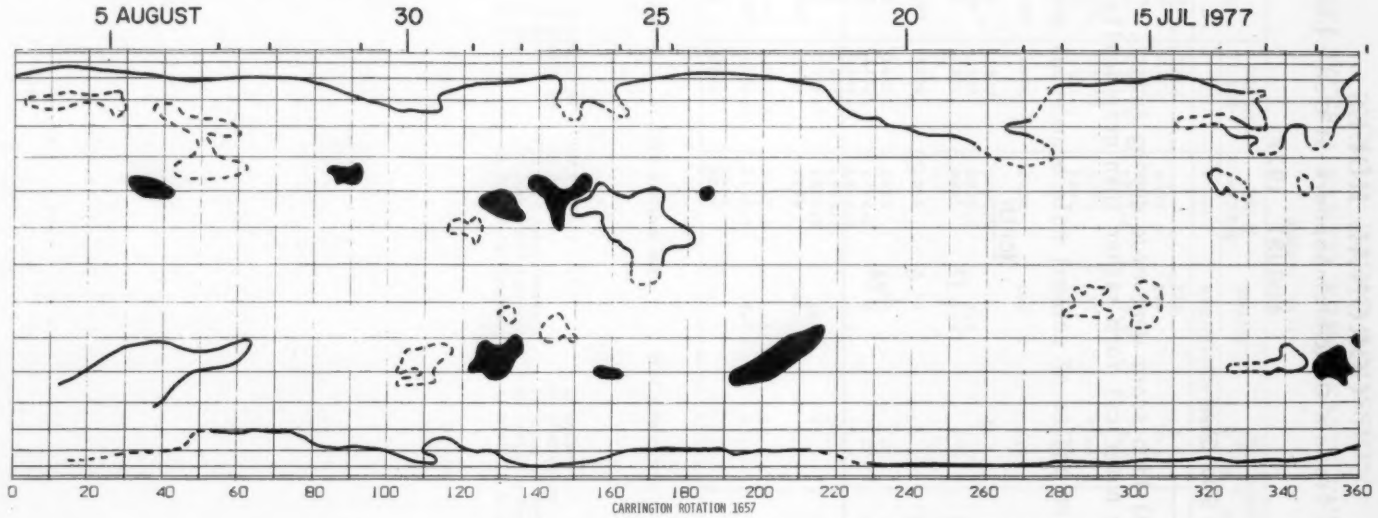
Position angles of coronal hole boundaries (in degrees)

Date	North		South	
August 4	37	- 3	-141	148
" 8	6	-29	-139	156
" 31	24	- 6	-158	144

HELIUM 10830Å SYNOPTIC MAPS

CARRINGTON ROTATION 1657

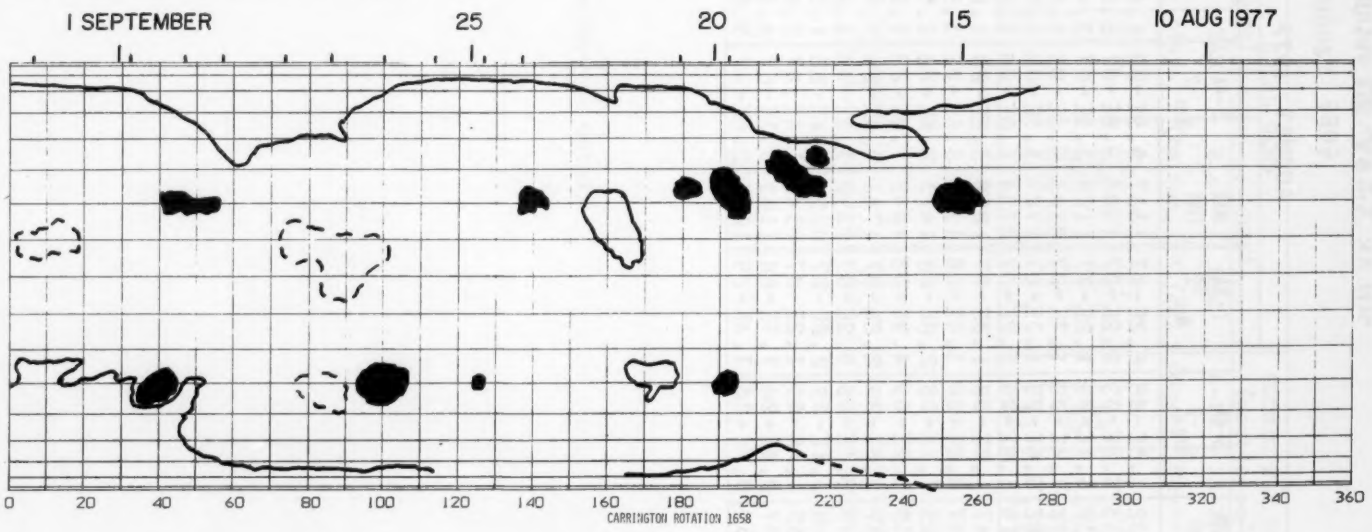
KITT PEAK NATIONAL OBSERVATORY



HELIUM 10830Å SYNOPTIC MAPS

CARRINGTON ROTATION 1658

KITT PEAK NATIONAL OBSERVATORY



21 Aug 77

SOLAR X-RAYS BY SATELLITE

GOES

AUGUST 1977

DAY	BEGIN TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	MAX TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	1/2P TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}
5	1332	1.5E-08	6.2E-07	1337	5.9E-08	1.0E-06	1340	2.9E-08	8.4E-07
5	1853	6.9E-09	2.2E-07	1903	9.0E-07	6.0E-06	1913	1.7E-07	2.9E-06
6	0930	6.1E-09	1.2E-07	1104	3.5E-07	3.4E-06	1129	6.5E-08	1.7E-06
7	0300	7.4E-09	1.7E-07	0303	8.3E-09	1.1E-06	0305	9.5E-09	1.7E-07
7	0702	6.6E-09	1.3E-07	0707	1.5E-08	1.0E-06	0709	8.5E-09	1.9E-07
7	0719	1.8E-09	1.2E-07	0724	1.0E-08	1.0E-06	0726	8.7E-09	1.7E-07
7	1047	1.0E-08	1.0E-07	1050	3.8E-09	1.0E-06	1052	3.4E-09	7.7E-08
7	1257	0.0E+00	3.8E-08	1338	3.6E-08	3.8E-06	1340	1.7E-08	5.9E-07
8	1409	7.1E-08	2.8E-08	1413	8.6E-08	2.5E-06	1415	1.2E-08	4.0E-08
9	1039	2.2E-09	4.9E-08	1042	1.0E-08	1.0E-06	1045	3.4E-09	5.7E-08
20	1737	2.6E-09	2.2E-07	1741	5.5E-08	1.0E-06	1743	2.2E-08	6.0E-07
22	2345	8.1E-09	5.2E-07	2350	5.2E-08	1.2E-06	2354	1.9E-08	8.5E-07
23	0448	3.1E-09	2.0E-07	0454	9.1E-08	1.3E-06	0504	2.0E-08	7.3E-07
26	0535	1.4E-09	1.2E-07	0540	1.4E-07	2.0E-06	0542	2.6E-09	2.3E-07
27	1057	0.0E+00	7.7E-08	1103	5.3E-07	4.9E-06	1109	8.9E-08	2.2E-06
31	0859	0.0E+00	7.4E-09	1016	2.8E-07	5.2E-06	1032	6.5E-08	2.4E-06

PIONEER VI

AUGUST 1977

Date Aug. 1977	DSN Coverage (UT)	Data Time (UT)	ESP (°)	SOLAR WIND AMES[1] U_{H^+} (km/sec)	AMES[1] TAU (days)	MIT[2] U_{H^+} (km/sec)	MIT[2] N_{H^+} (H^+/cc)	COSMIC RAY PROTONS[3] (particles/sec) 6-13 (Mev*)	13-175 (Mev**)	>175 (Mev)
15	0236-0658	0300	-009.5	383.†	0.13	371.	16.	1.7	0.133	1.55
		0400		383.		368.	13.8	1.69	.142	1.61
		0500		339.		360.	11.8	1.88	.132	1.59
		0600		383.		371.	15.2	1.7	.126	1.52
		0700		383.		362.	13.1	1.61	.144	1.55

[1] Wolfe - NASA/ARC
[2] Simpson - University of Chicago

* Includes He 0.6-13 Mev/nucleons and electrons ∿0.5 Mev - see J. Retzler and J. A. Simpson, J. Geophys. Res., 74, 9, 2149-2160, 1969 for discussion of the electron response of Pioneer VII.

** Includes He >13 Mev/nucleons.
Q Used to indicate that a rate is at its quiescent level.

ESP = Earth-Sun Probe Angle.

† Peak velocity.

Note: Data sampled hourly unless otherwise noted.

INFERRED IP MAGNETIC FIELD

BARTELS ROTATION	DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1949	FEB 9				-	-		-	TA		AT	A*		TA						T*					*		TA	TA*
1950	MAR 7							-		TA	A*		TA					*	*	AT			T*				-	TA	
1951	APR 3							*				*								AT	TA	T*	T*			*	AT	TA	A*	
1952	APR 30		AT					TA	AT	T*	-			-	-	-			A*	TA	AT	AT		A*				-	
1953	MAY 27	-						*	TA						-	*			-					T*					
1954	JUN 23						AT			AT		TA	T*	AT			TA	A*					AT	A*	TA	AT	AT			A*
1955	JUL 20		T*								TA	A*								AT	T*	TA	TA	TA	-	TA	TA			
1956	AUG 16							TA	T*							*		AT			-	AT	-	AT	-	TA	-	-	-	-
1957	SEP 12	-	-	AT	-	-	-	-	-	-	-	AT	-	-	AT	-	AT	-	-	-	-			AT				-		
1958	OCT 9	AT *	A*		A*		*				TA		A*			*			*		TA	AT	AT		-			AT		
1959	NOV 5	AT	TA			TA		T*		*	AT *		-			*												*		
1960	DEC 2							TA		*						AT		*					-	*			-	TA	-	
1961	DEC 29	-	AT	-	*	*	*		AT				*			*	A*		*	*				*					AT	
1962	1977 JAN 25			-			-	-	TA	-	A*			AT	-		*	-			*	-				TA				
1963	FEB 21	AT	-	-	-	-	TA		TA			*									-			-						
1964	MAR 20		TA		AT					*			-	-						A*				-					
1965	APR 16			TA		TA	-	AT	TA			AT				-	-	TA		AT	AT			TA					AT	
1966	MAY 13	TA	-	-		TA			TA											AT	-	-	AT	T*	-	T*			AT	AT	-
1967	JUN 9								TA		-			TA						AT	A*						AT	*	A*		TA	TA
1968	JUL 6										A*			T*	TA	TA		T*			AT					-	AT			-		
1969	AUG 2		TA						TA	-			TA	*									AT	TA							
1970	AUG 29			-																										

= definitely towards the sun = definitely away from the sun

T = towards the sun A = away from the sun * = effect doubtful or not discernible - = missing data

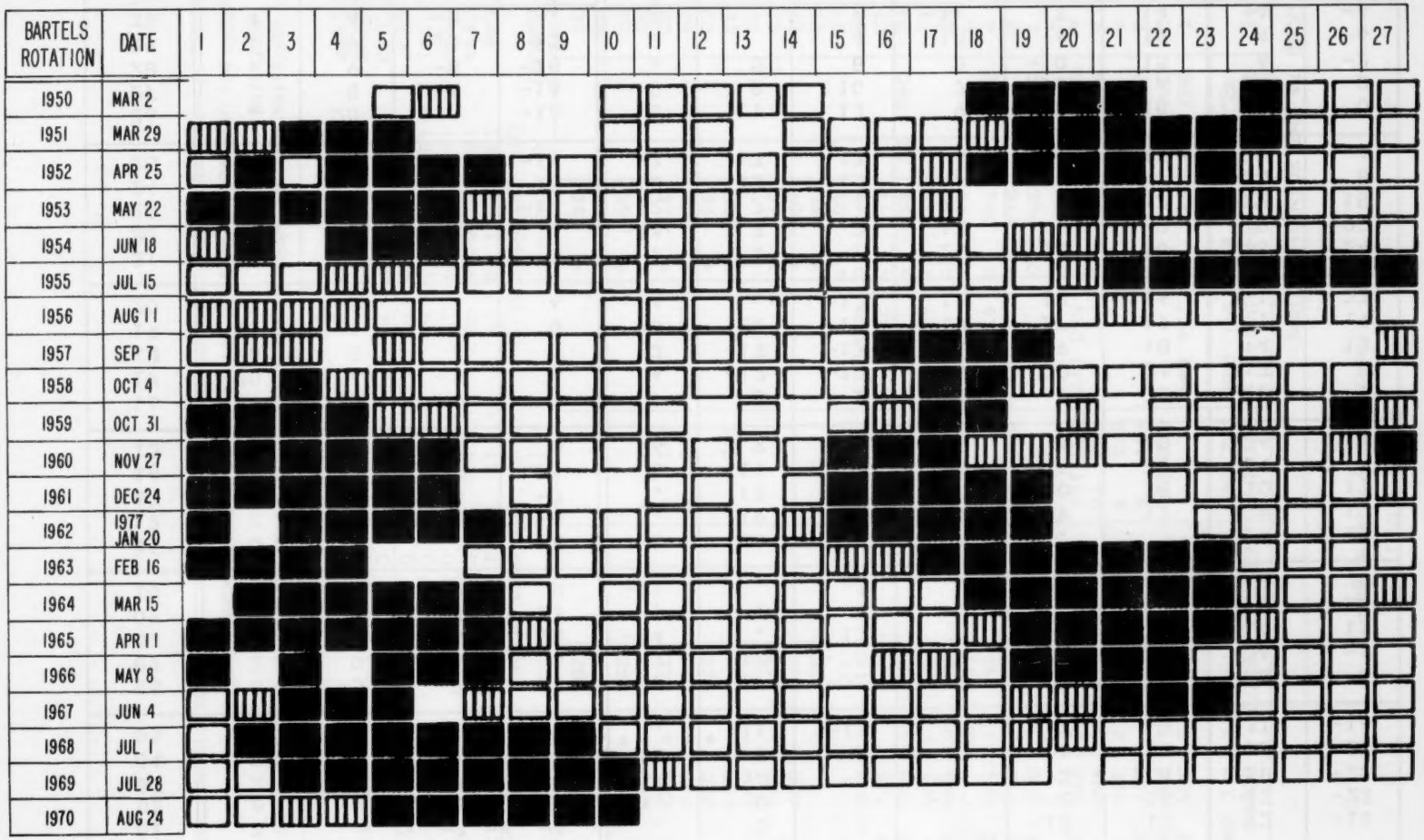
The table shows daily inferences of the polarity of the interplanetary magnetic field. The first half of the day is based principally on magnetograms produced by the magnetometer at the Vostok Antarctic Station of the USSR. The magnetometer of the U.S. Air Weather Service now operated at Thule by the Danish Meteorological Institute is used for the second half of the day.

Note: The Bartels Rotation numbers after Rotation number 1955 were incorrect in this Table in SGD issues 385 Part I through 389 Part I.

Errata: Thule data for December 5, 6, 10, 11, 12 and 19, 1976 have been corrected.

the Danish Meteorological Institute is used for the second half of the day.
Note: The Bartels Rotation numbers after Rotation number 1955 were incorrect in this Table in SGD issues 385 Part I through 389 Part I.
Errata: Thule data for December 5, 6, 10, 11, 12 and 19, 1976 have been corrected.

STANFORD MEAN SOLAR MAGNETIC FIELD



POLARITY OF THE MEAN SOLAR MAGNETIC FIELD: □ = FIELD >2μT, ▥ = -2μT FIELD 2μT, ■ = FIELD <-2μT
No box visible indicates no data available for that day.

Note: Data are taken daily at 2000 UT.
Dates given are not Bartels Rotation dates.
These earlier dates correspond to the occurence of phenomena on the sun which affect the Earth during the given Bartels Rotation.

STANFORD MEAN SOLAR MAGNETIC FIELD (MICROTESLA)

	1976				1977							
	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.
DAY												
01	5	.	-2	-4	.	5	2	-7	-13	13	2	-16
02	6	.	-3	-2	.	0	0	-17	-6	15	-12	-23
03	2	-1	-4	5	4	-6	-2	-16	-5	15	-18	-25
04	8	1	1	13	15	-8	-9	-12	1	13	-26	-23
05	7	7	1	21	.	-11	-17	-9	7	0	-31	-16
06	6	-5	7	23	3	-17	-22	-4	11	-19	-33	-5
07	3	0	16	25	-7	-12	-20	0	7	-32	-26	-1
08	-2	2	25	18	-14	.	-13	5	-5	-31	-14	11
09	1	6	23	13	-9	.	-9	8	.	.	-7	25
10	.	13	12	8	-11	.	-3	2	-22	0	3	20
11	0	19	.	-3	-8	21	3	-4	.	7	20	17
12	2	21	9	-4	.	19	11	-7	-29	17	29	12
13	8	24	.	-7	.	13	18	-14	-20	28	30	11
14	12	29	4	-1	8	11	3	-8	-5	38	24	5
15	17	22	-2	0	6	9	.	-8	4	40	26	7
16	20	19	-4	0	9	-3	-9	-11	12	31	18	.
17	30	14	-3	6	6	-12	-12	-9	20	24	13	5
18	20	5	.	3	3	-13	-13	1	29	18	4	13
19	15	-1	0	8	0	-20	-15	13	27	19	1	19
20	11	-9	.	6	-4	.	-12	18	19	16	-1	23
21	5	-5	11	5	.	.	-7	21	12	10	6	24
22	-3	-1	9	1	-14	3	2	13	.	2	9	22
23	-12	6	2	-10	-12	7	.	17	1	-2	22	18
24	-10	12	5	-10	-12	12	15	9	-1	-7	25	8
25	-6	14	-5	-14	-7	13	13	6	4	-15	31	4
26	.	20	0	-16	-6	11	13	9	-10	-10	30	0
27	.	8	-6	-16	0	9	10	7	-10	4	24	2
28	.	9	-5	-10	6	5	8	2	-10	15	6	-2
29	.	9	-12	-5	8		4	-10	-4	19	4	-6
30	4	4	-8	.	7		7	-11	3	14	-4	-6
31		-4		11	7		6		6		-10	-11

SOLAR WIND

Interplanetary Scintillations

AUGUST 1977

UCSD 74 MHZ SCINTILLATIONS

DAY	3C48 VEL	3C48 ERR	3C144 VEL	3C144 ERR	3C147 VEL	3C147 ERR	3C161 VEL	3C161 ERR	3C237 VEL	3C237 ERR	3C273 VEL	3C273 ERR	3C298 VEL	3C298 ERR	3C459 VEL	3C459 ERR
1	387	83	497	13	756	134			407	85	240	10	334	42		
2	376	44	443	24			622	170			406	31	281	39		
3	389	55	267	45			439	6					337	20		
4			315	26			575	4			374	7	331	4		
5	452	50	377	8			752	10			335	10	400	6		
6	346	31	334	8	550	117	683	184			450	35	274	70		
6											375	15				
7	524	23	350	33									321	70		
8			514	26			580	22					366	48		
9	333	6	540	2	472	44					362	11	538	31		
9											311	9				
10			480	35			547	1			336	16	253	30		
11			464	24	462	74	596	125			377	63	379	0		
12	342	53	458	4							464	91	426	30		
13			416	15	229	16	482	22					371	44		
14			470	10	405	115										
15			409	47												
16			361	*							307	*				
18			608	*									367	*		
19			597	*							299	*	280	*		
21													269	*		
22			506	*			445	*					324	*		
23			334	*							276	*	322	*		
24			418	*	284	*	323	*			267	*	392	*		
25			374	*			451	*			271	*	307	*		
26			327	*	389	*	343	*			282	*	315	*		
27			387	*							254	*	357	*		
28			532	*												
31			342	*							286	17	299	*		

AUGUST 5	UT	LAT	DIST	DLON	15 UT	LAT	DIST	DLON	25 UT	LAT	DIST	DLON
3C48	13.	12.	1.08	15.	12.	12.	1.13	14.	12.	12.	1.16	12.
3C144	17.	6.	0.76	40.	16.	6.	0.86	31.	15.	6.	0.93	21.
3C147	16.	27.	0.79	33.	15.	21.	0.87	26.	15.	17.	0.93	19.
3C161	18.	-21.	0.71	36.	17.	-14.	0.79	31.	17.	-9.	0.87	25.
3C237	22.	-13.	0.30	-70.	21.	-26.	0.15	-77.	20.	-59.	0.07	69.
3C273	24.	6.	0.79	-38.	23.	7.	0.68	-48.	22.	9.	0.55	-58.
3C298	1.	10.	0.98	-17.	1.	12.	0.93	-21.	0.	16.	0.86	-30.
3C459	10.	8.	1.25	8.	9.	8.	1.27	6.	9.	9.	1.29	4.

* indicates data for which no error estimate is available since only two antennas were operating.

3C273 was observed at 0000 UT before August 9 and at 2300 UT after August 9.

JULY 1977 DATA

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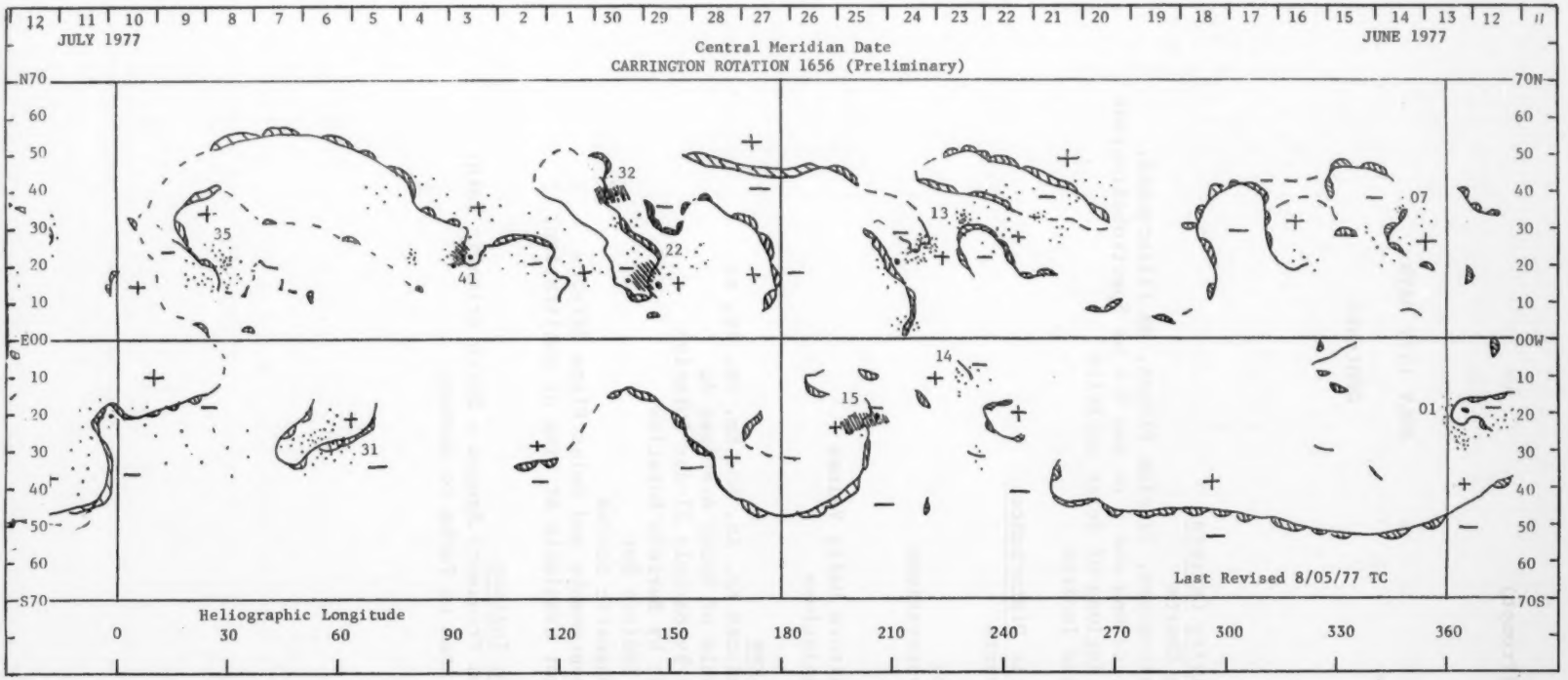
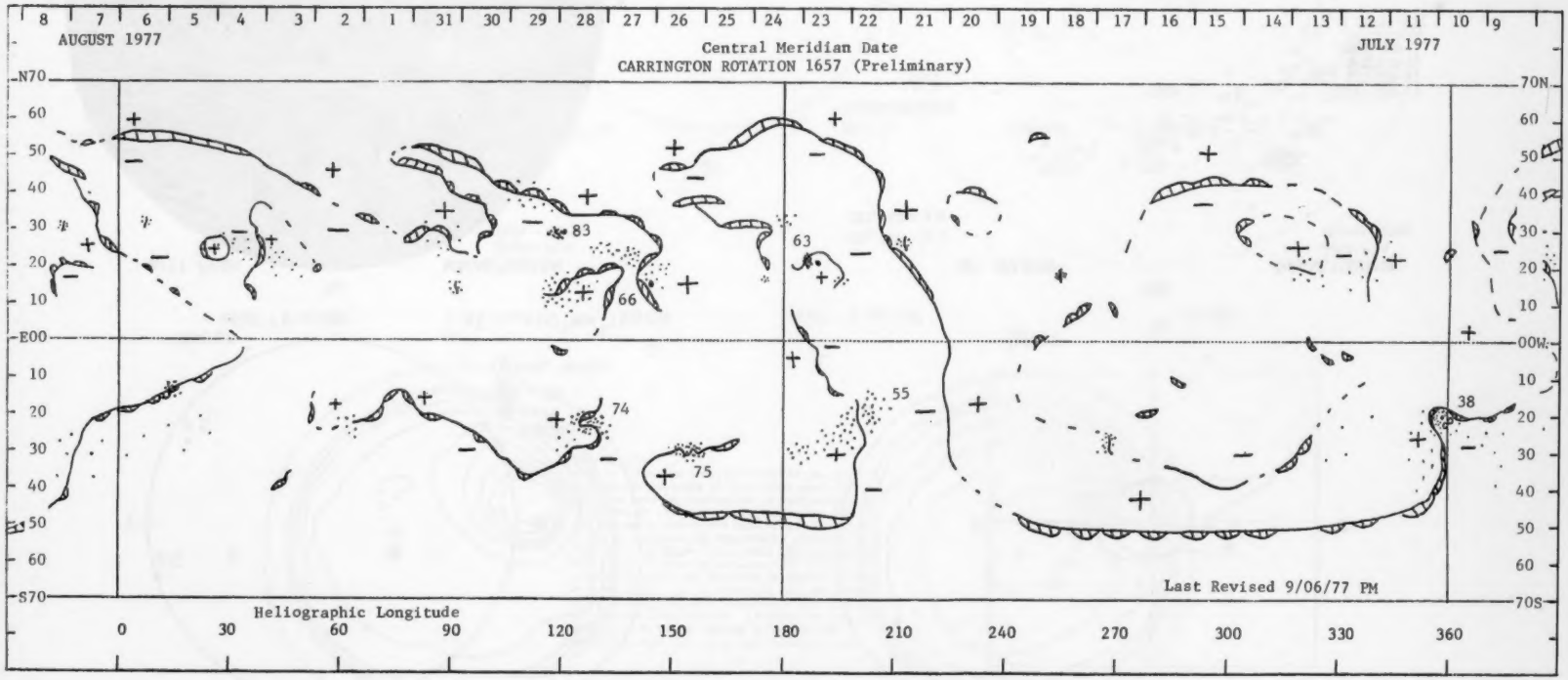
Hα SYNOPTIC CHART

CARRINGTON ROTATION 1656 (PRELIMINARY)



Hα SYNOPTIC CHART

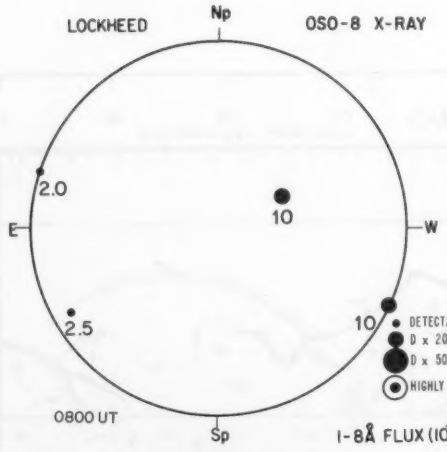
CARRINGTON ROTATION 1657 (PRELIMINARY)



31 Jul 77

JULY 1, 1977 (P = -2.75, B_o = 2.90, L_o = 129.10)

LOCKHEED OSO-8 X-RAY

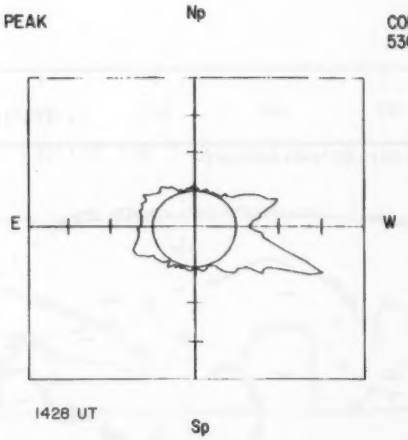


1-8Å FLUX (10^{-8} Wm^{-2})

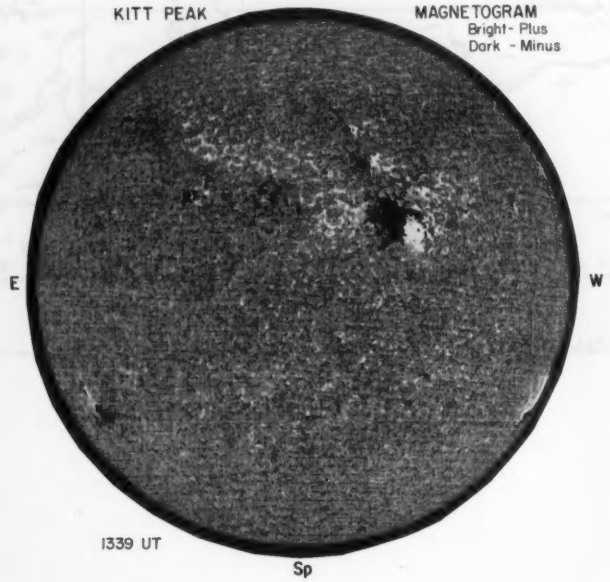
Beginning with this issue the Lockheed X-ray maps will no longer provide a temperature for each emitting source. Instead, the 1-8 A flux (in Wm^{-2}) of each resolvable X-ray source will be given. It is estimated that the absolute flux values are accurate to about a factor of 2, while the relative errors are typically less than 15%. The use of dots of different sizes to indicate the approximate intensity and whether a source has been highly variable in intensity is continued. Temperature and emission measure information is obtainable for all sources recorded by this experiment but will no longer be routinely reduced for this presentation.

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

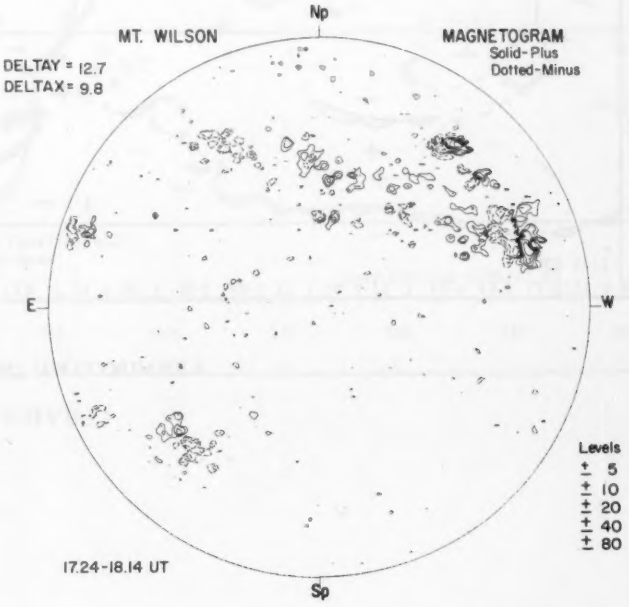


KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



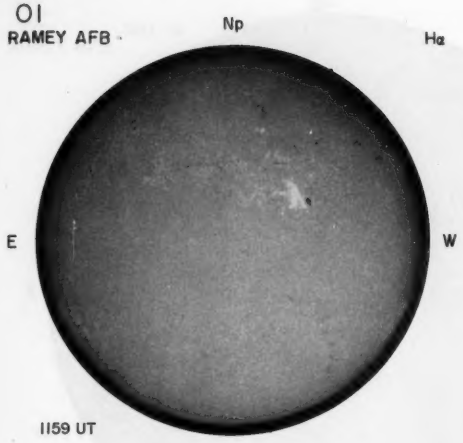
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY = 12.7
DELTAX = 9.8



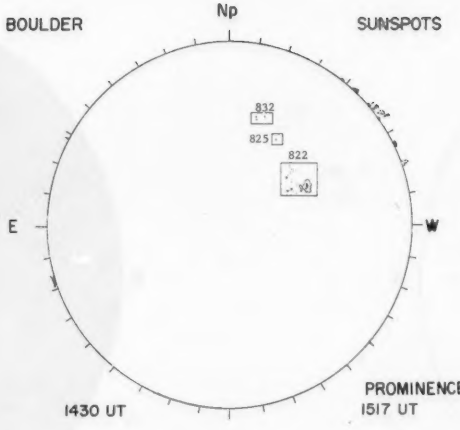
01

RAMEY AFB



1159 UT

Hα BOULDER



1430 UT

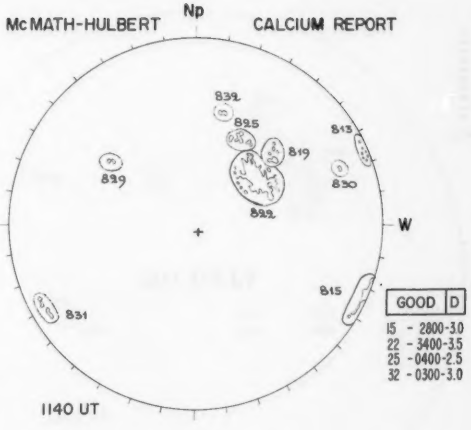
SUNSPOTS

PROMINENCES

1517 UT

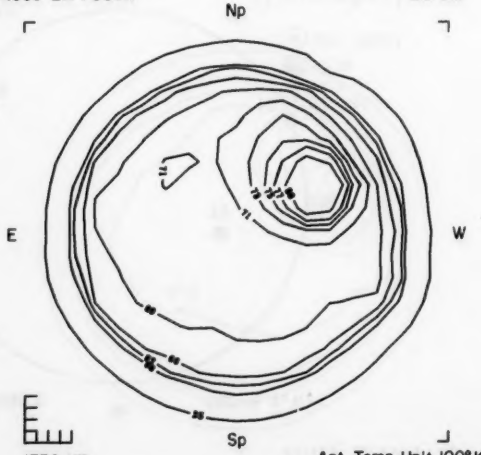
McMATH-HULBERT

CALCIUM REPORT



1140 UT

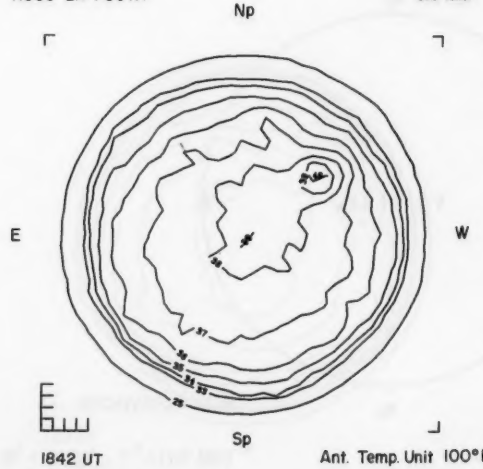
NOSC LA POSTA 2.0 CM



1730 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

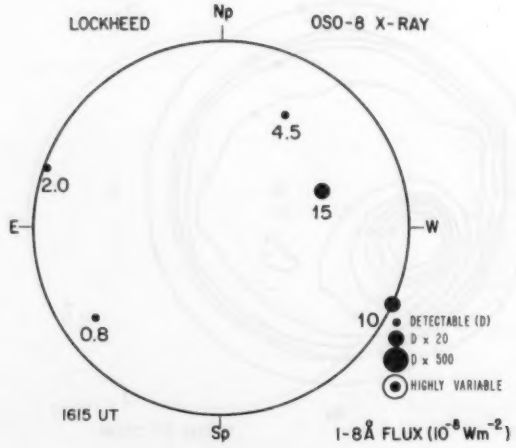


1842 UT

Ant. Temp. Unit 100°K

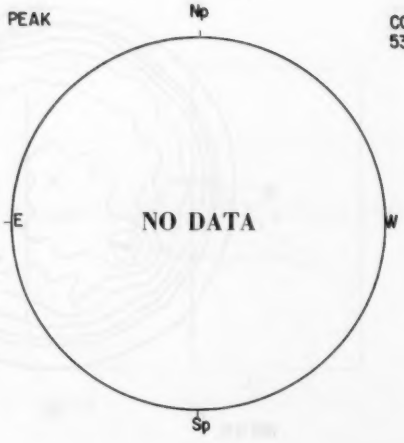
JULY 2, 1977 (P = -2.29, B_0 = 3.01, L_0 = 115.86)

LOCKHEED OSO-8 X-RAY



SACRAMENTO PEAK

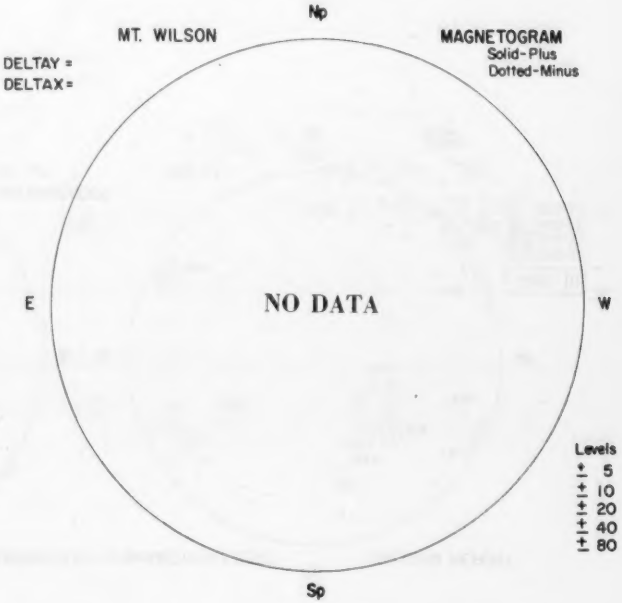
CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

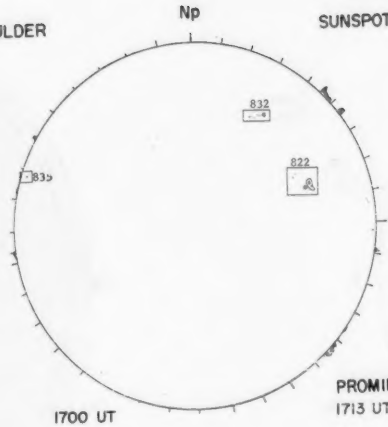
DELTAY =
DELTAX =



RAMEY AFB

1228 UT

Hα BOULDER



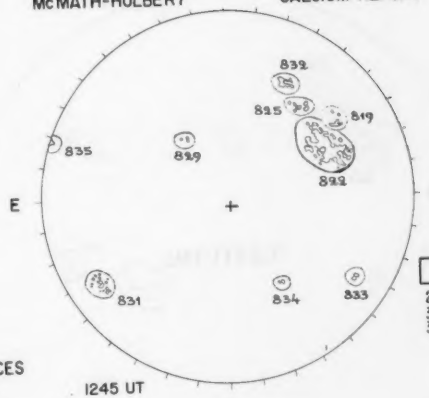
1700 UT

SUNSPOTS

PROMINENCES

1713 UT

McMATH-HULBERT



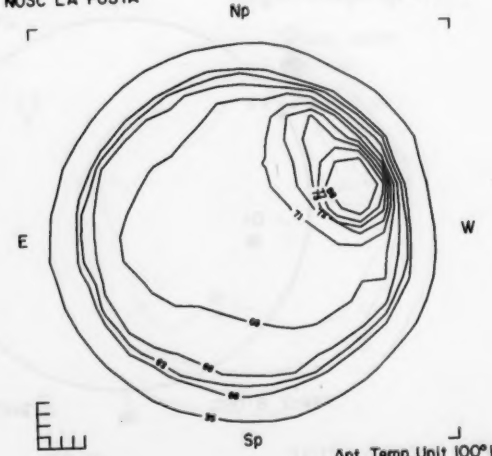
1245 UT

CALCIUM REPORT

GOOD	M
22 - 3200 - 3.5	
32 - 0600 - 3.5	
33 - 0200 - 2.5	

NOSC LA POSTA

2.0 CM

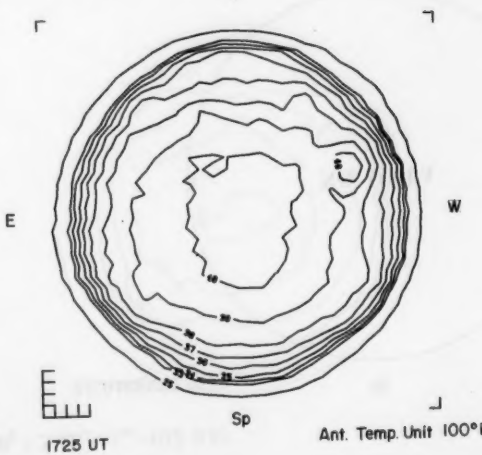


1626 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

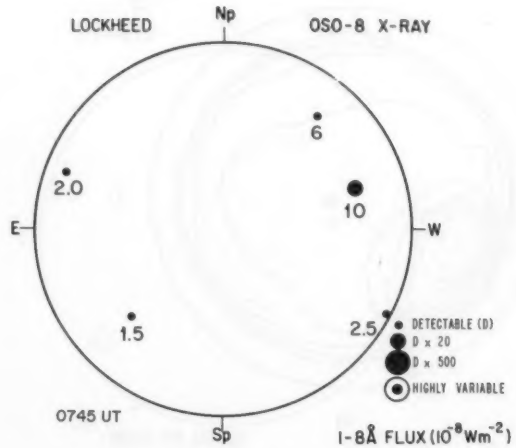


1725 UT

Ant. Temp. Unit 100°K

JULY 3, 1977 (P = -1.84, B_o = 3.12, L_o = 102.63)

LOCKHEED OSO-8 X-RAY



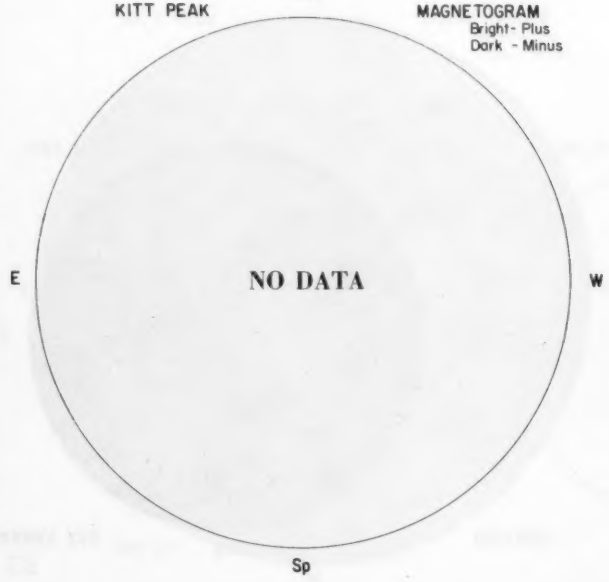
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

KITT PEAK

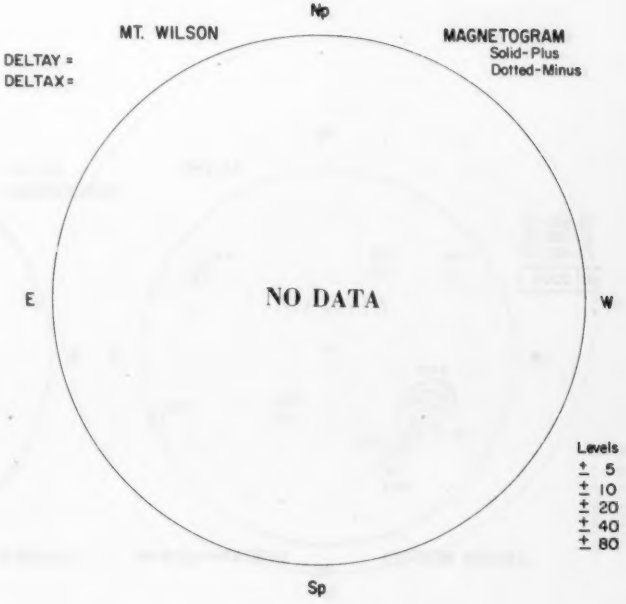
MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON

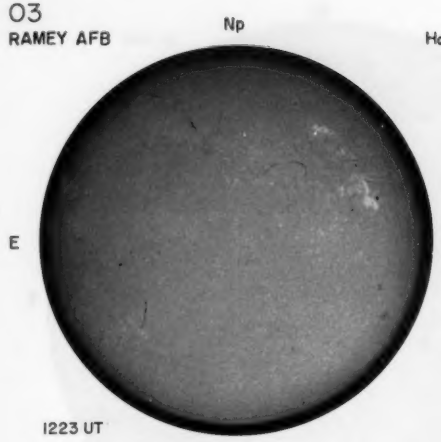
DELTAY =
DELTAX =

MAGNETOGRAM
Solid - Plus
Dotted - Minus



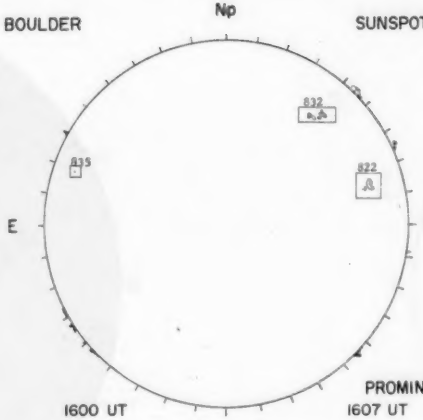
03

RAMEY AFB



1223 UT

Hα BOULDER



1600 UT

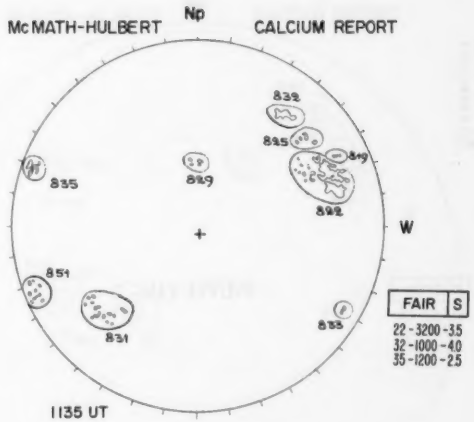
SUNSPOTS

PROMINENCES

1607 UT

McMATH-HULBERT

CALCIUM REPORT

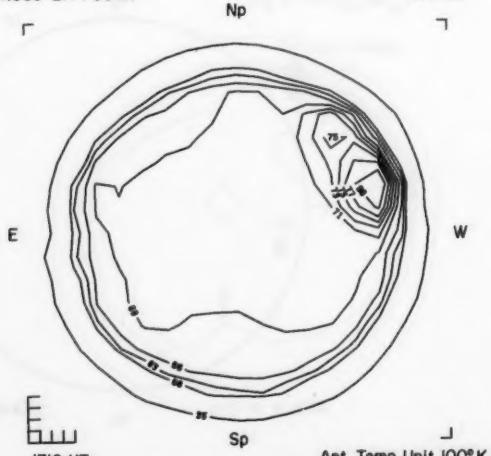


1135 UT

FAIR | S

22 - 3200 - 35
32 - 1000 - 40
35 - 1200 - 25

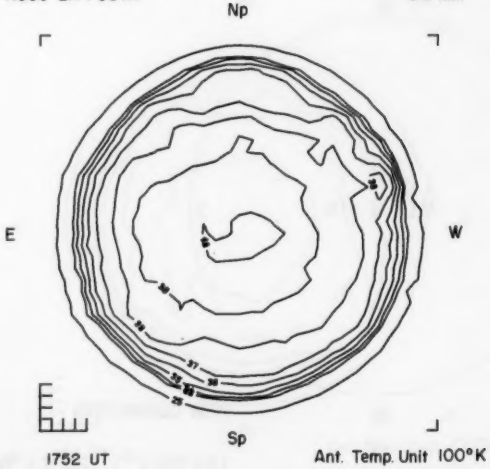
NOSC LA POSTA 2.0 CM



1716 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

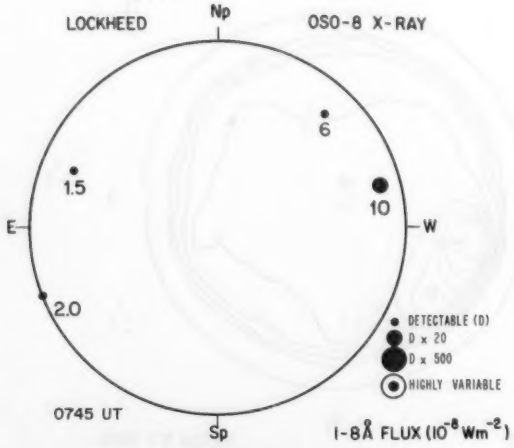


1752 UT

Ant. Temp. Unit 100°K

JULY 4, 1977 (P = -1.38, B_o = 3.22, L_o = 89.39)

LOCKHEED — OSO-8 X-RAY



0745 UT

1-8Å FLUX (10^{-8} Wm^{-2})

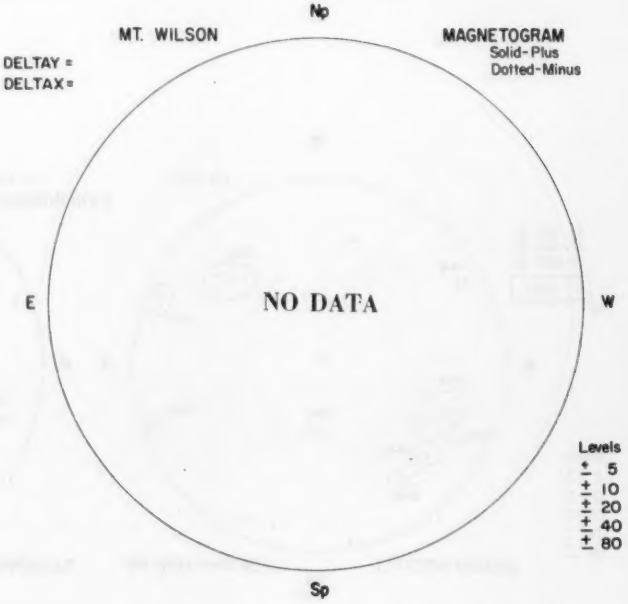
SACRAMENTO PEAK — CORONA (1.15 $R_\odot$) 5303 Å

KITT PEAK — MAGNETOGRAM
Bright - Plus
Dark - Minus

1431 UT

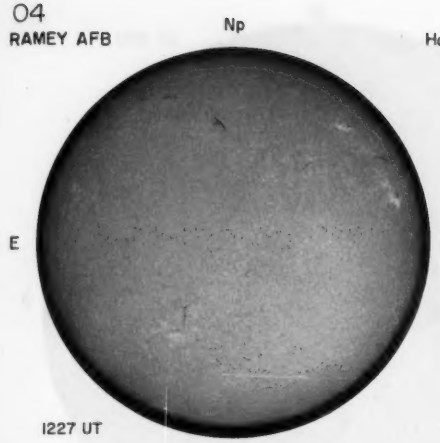
MT. WILSON — MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =



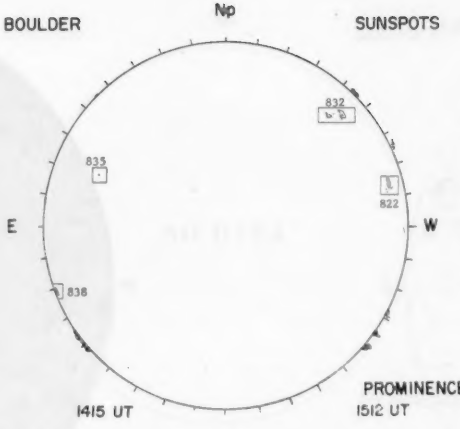
04

RAMEY AFB



1227 UT

Hα BOULDER



1415 UT

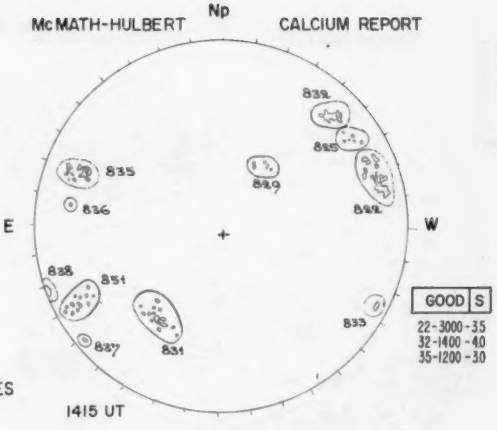
SUNSPOTS

PROMINENCES

1512 UT

McMATH-HULBERT

CALCIUM REPORT

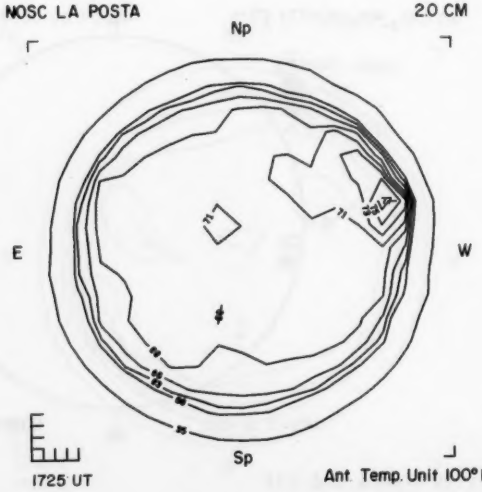


1415 UT

GOOD	S

22-3000-35
32-1400-40
35-1200-30

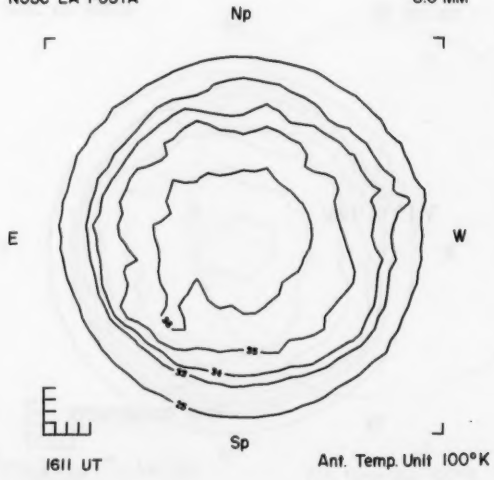
NOSC LA POSTA 2.0 CM



1725 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

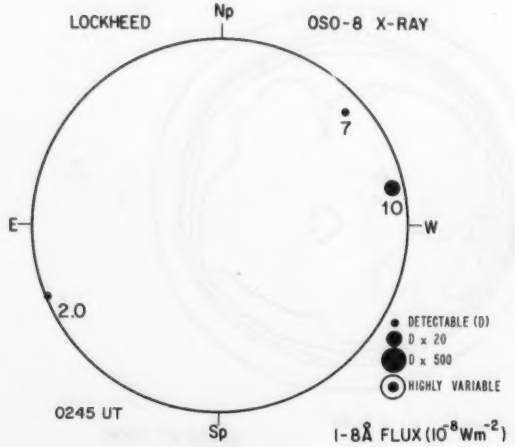


1611 UT

Ant. Temp. Unit 100°K

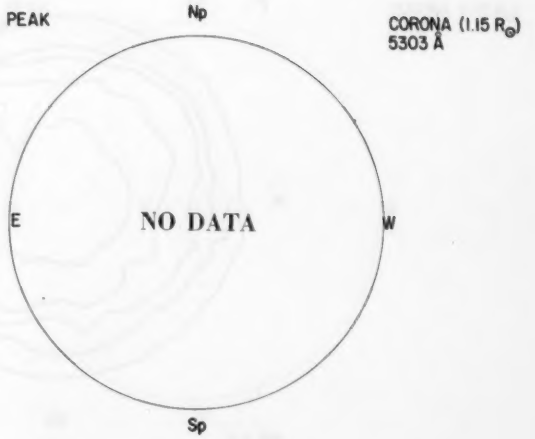
JULY 5, 1977 (P=-0.93, B_o=3.33, L_o=76.16)

LOCKHEED OSO-8 X-RAY

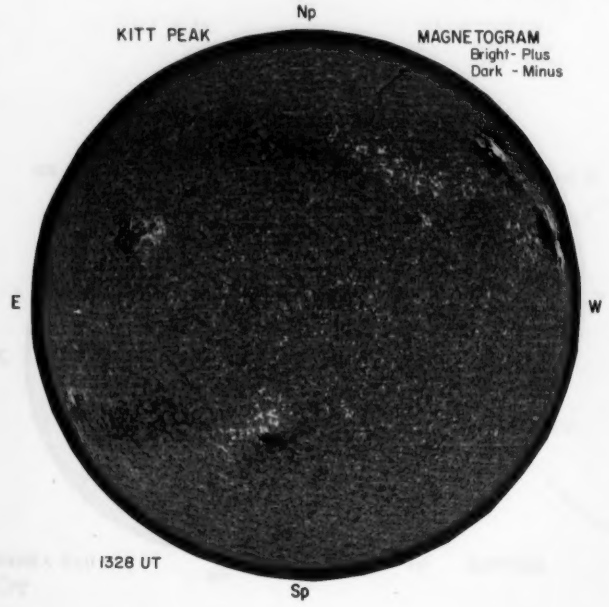


1-8Å FLUX (10^{-8} Wm^{-2})

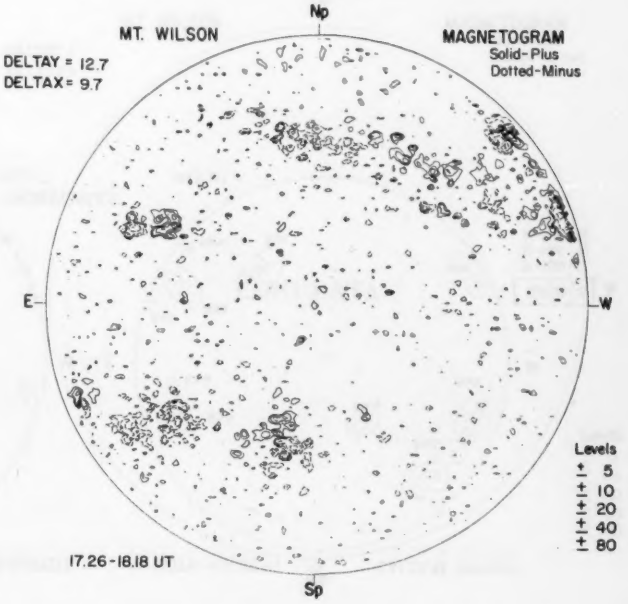
SACRAMENTO PEAK



KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

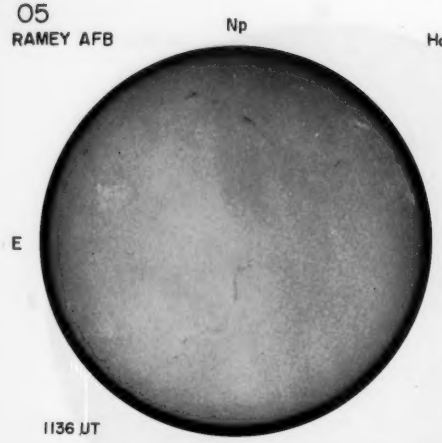


MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.7
DELTAX = 9.7

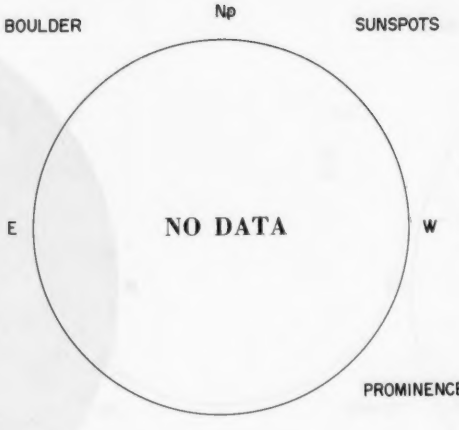


05

RAMEY AFB



Hα BOULDER

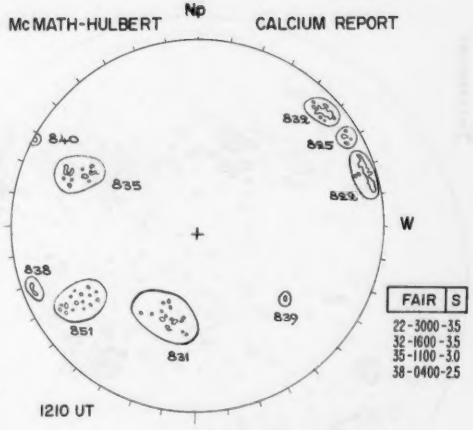


SUNSPOTS

PROMINENCES

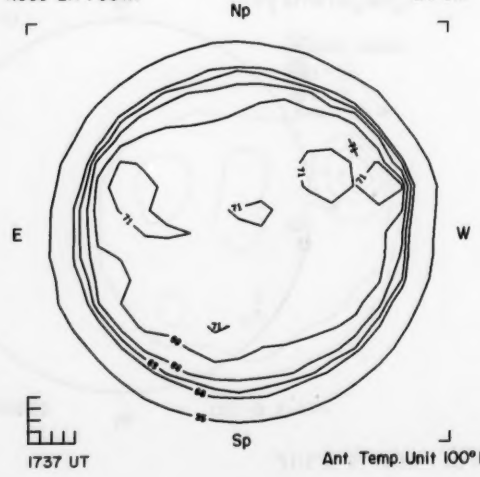
McMATH-HULBERT

CALCIUM REPORT



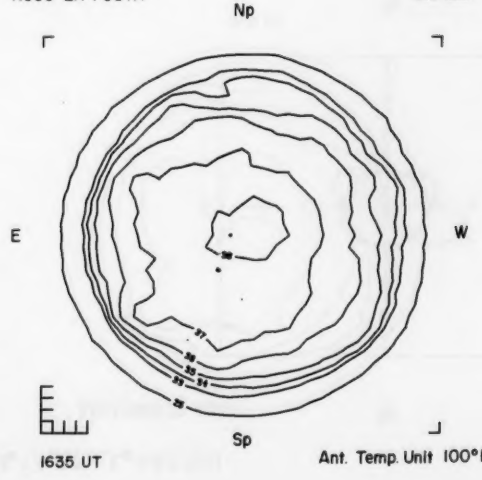
FAIR	S
22-3000-35	
32-1600-35	
35-1100-3.0	
38-0400-2.5	

NOSC LA POSTA 2.0 CM



Ant. Temp. Unit 100°K

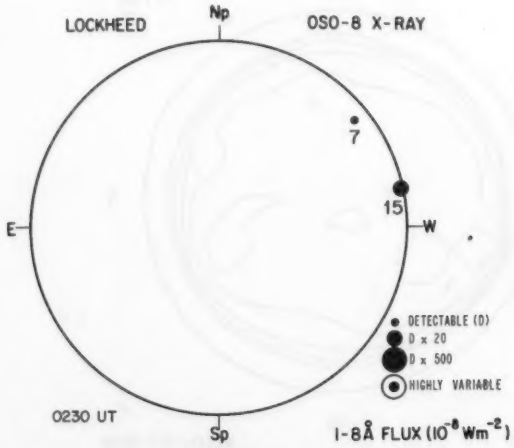
NOSC LA POSTA 8.6 MM



Ant. Temp. Unit 100°K

JULY 6, 1977 (P=-0.48, B_o=3.44, L_o=62.92)

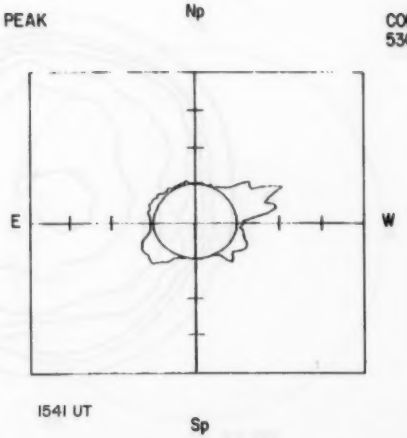
LOCKHEED — OSO-8 X-RAY



0230 UT

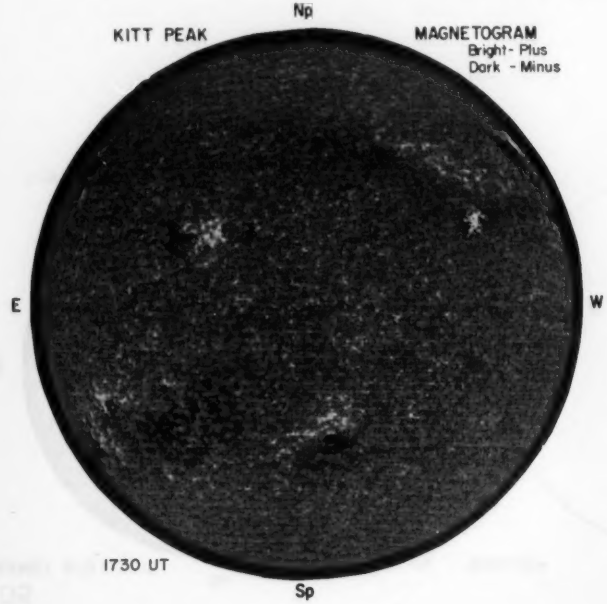
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK — CORONA (1.15 $R_\odot$) 5303 Å



1541 UT

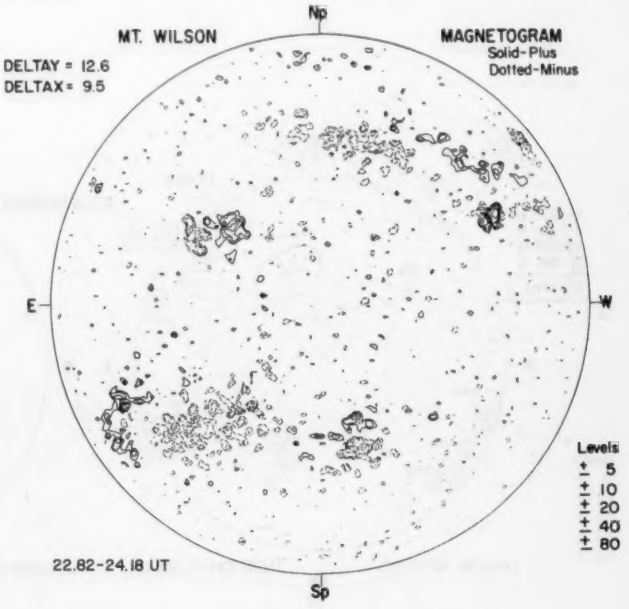
KITT PEAK — MAGNETOGRAM
Bright - Plus
Dark - Minus



1730 UT

MT. WILSON — MAGNETOGRAM
Solid - Plus
Dotted - Minus

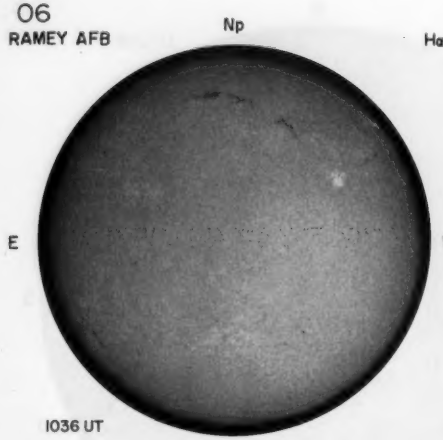
DELTAY = 12.6
DELTAX = 9.5



22.82-24.18 UT

06

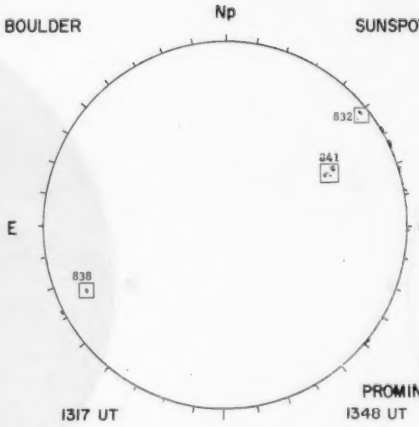
RAMEY AFB



Hα

1036 UT

BOULDER



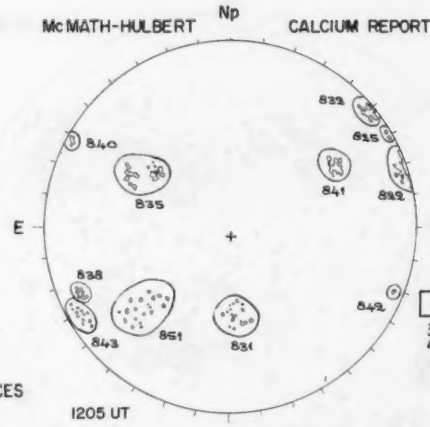
SUNSPOTS

1317 UT

PROMINENCES

1348 UT

McMATH-HULBERT



CALCIUM REPORT

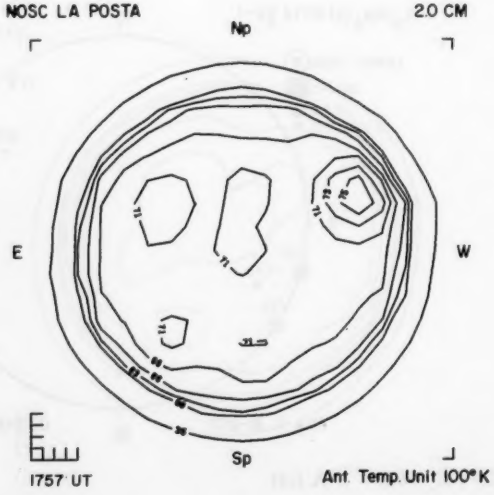
FAIR	S

32-1700-35
41-1000-40

1205 UT

NOSC LA POSTA

2.0 CM

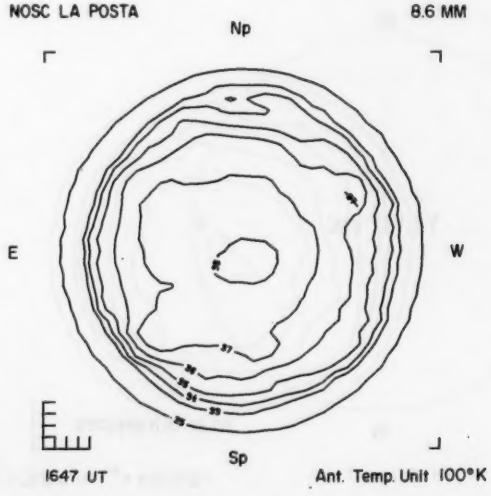


1757 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

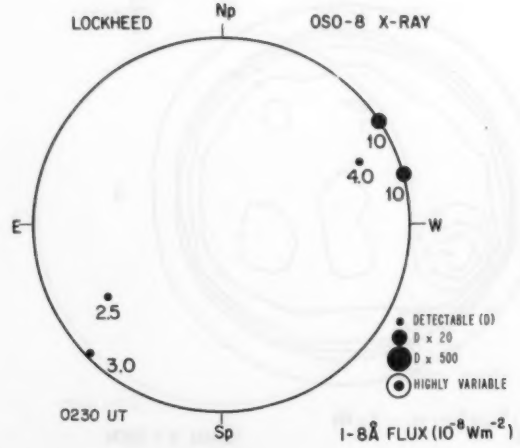


1647 UT

Ant. Temp. Unit 100°K

JULY 7, 1977 (P = -0.02, B_0 = 3.54, L_0 = 49.68)

LOCKHEED OSO-8 X-RAY

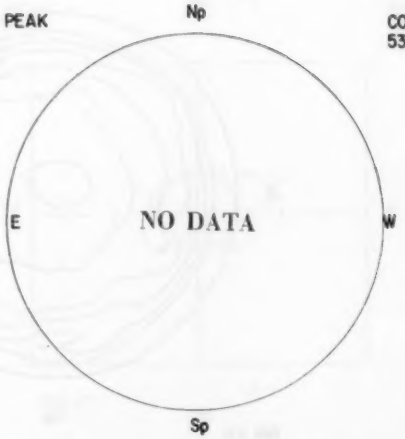


0230 UT

1-8Å FLUX (10^{-8} Wm^{-2})

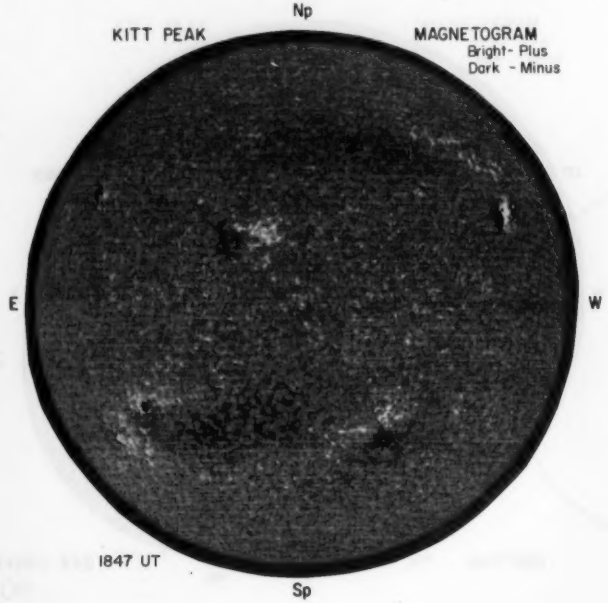
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

MAGNETOGRAM
Bright - Plus
Dark - Minus

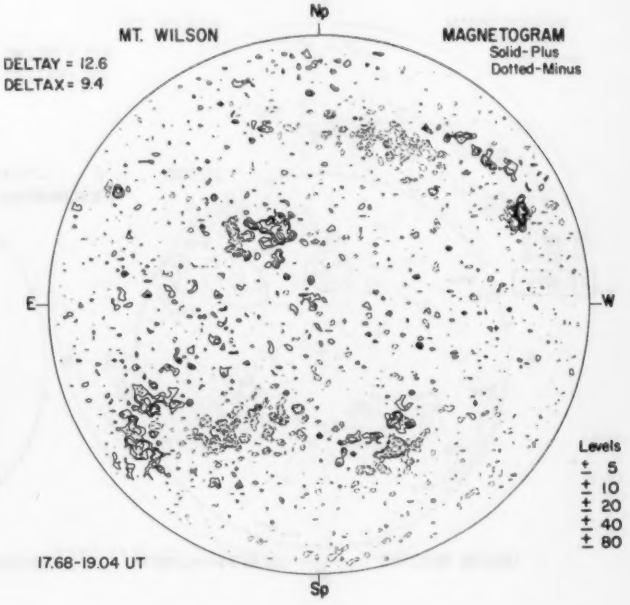


1847 UT

MT. WILSON

MAGNETOGRAM
Solid - Plus
Dotted - Minus

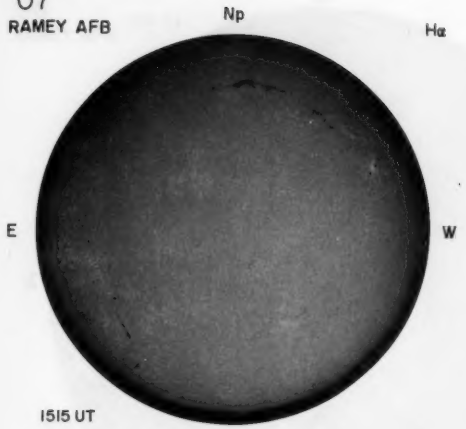
DELTAY = 12.6
DELTAX = 9.4



17.68-19.04 UT

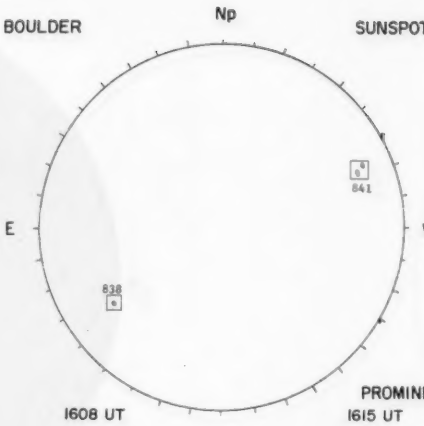
07

RAMEY AFB



1515 UT

Hα BOULDER



1608 UT

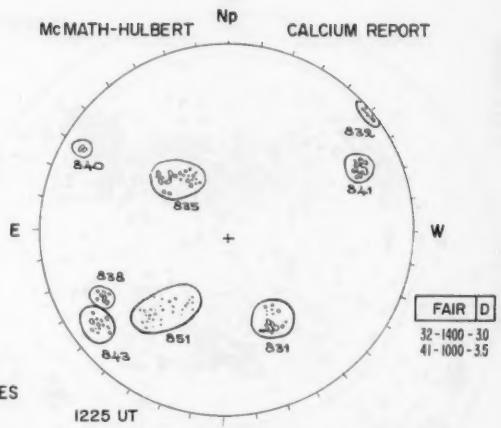
SUNSPOTS

PROMINENCES

1615 UT

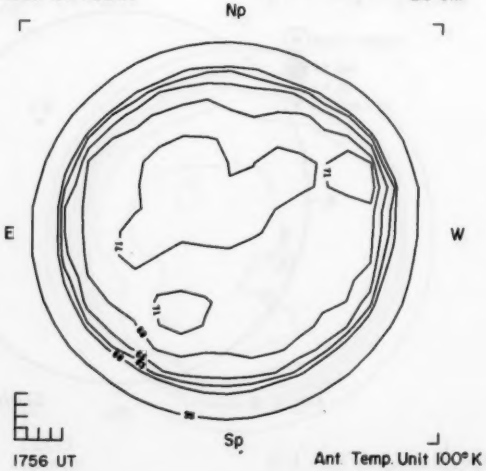
McMATH-HULBERT

CALCIUM REPORT



1225 UT

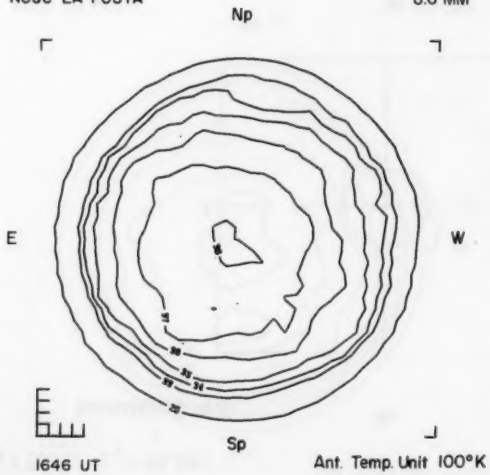
NOSC LA POSTA 2.0 CM



1756 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

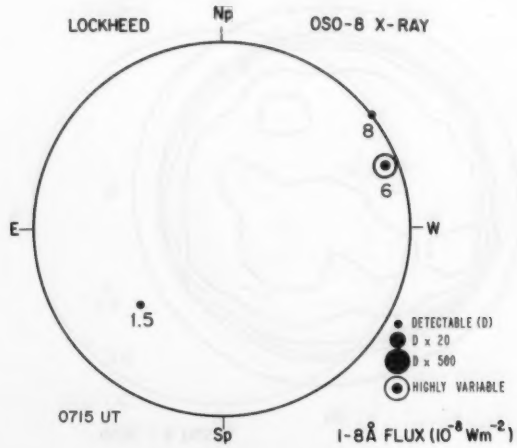


1646 UT

Ant. Temp. Unit 100°K

JULY 8, 1977 (P = 0.43, B_o = 3.65, L_o = 36.45)

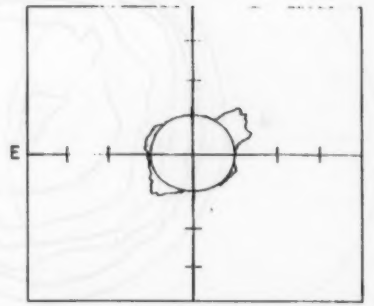
LOCKHEED OSO-8 X-RAY



1-8Å FLUX (10^{-8} Wm^{-2})

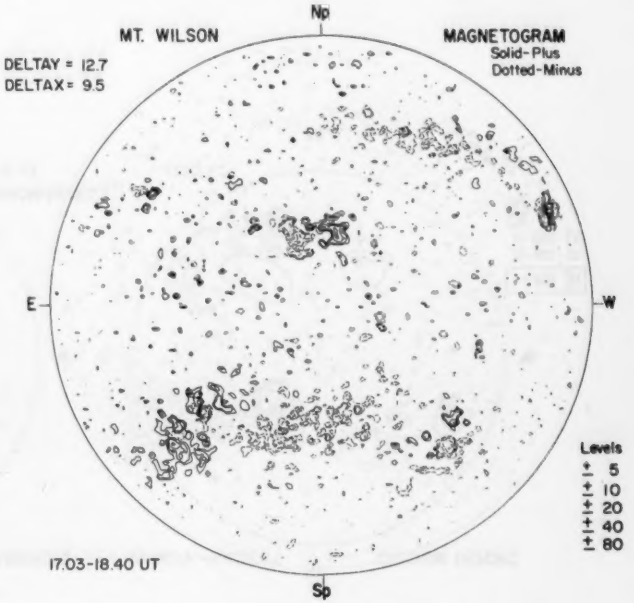
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



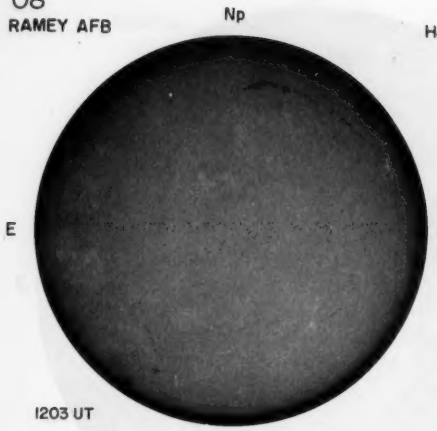
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.7
DELTAX = 9.5



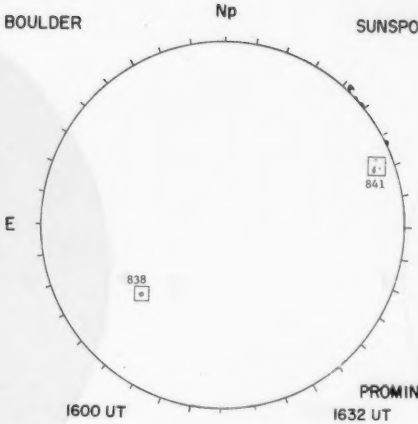
08

RAMEY AFB



1203 UT

Hα BOULDER



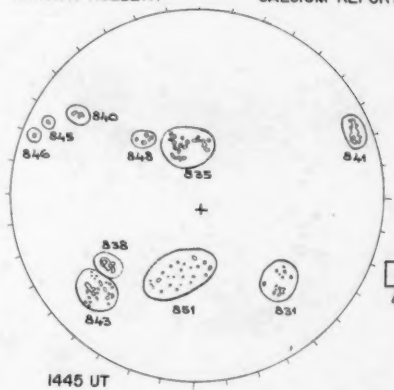
1600 UT

SUNSPOTS

1632 UT

PROMINENCES

McMATH-HULBERT



1445 UT

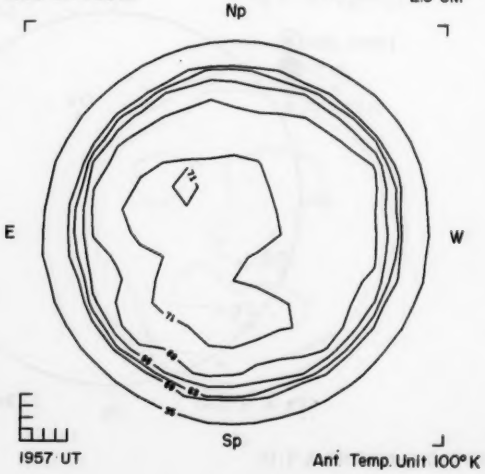
CALCIUM REPORT

FAIR | M

41 - 1500 - 3.0

NOSC LA POSTA

2.0 CM

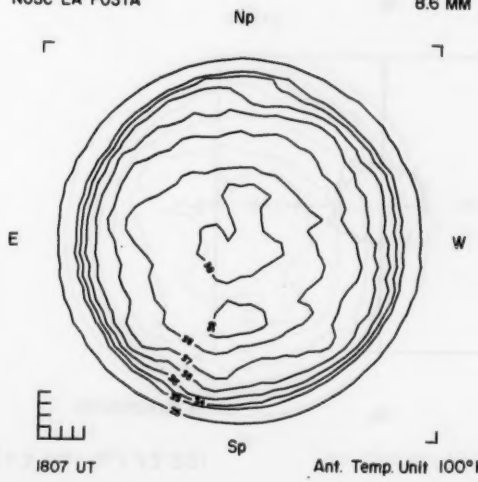


1957 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM



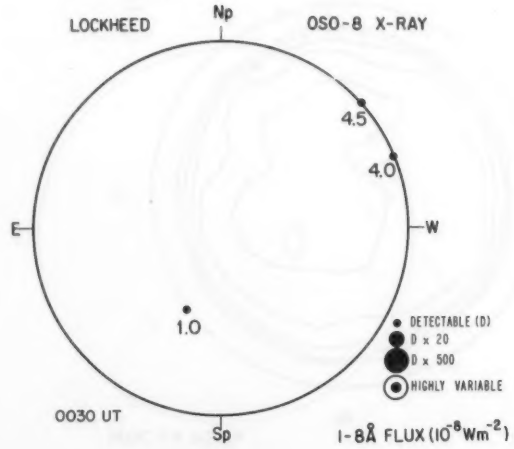
1807 UT

Ant. Temp. Unit 100°K

47
Jul 77

JULY 9, 1977 (P = 0.88, B_o = 3.75, L_o = 23.22)

LOCKHEED OSO-8 X-RAY

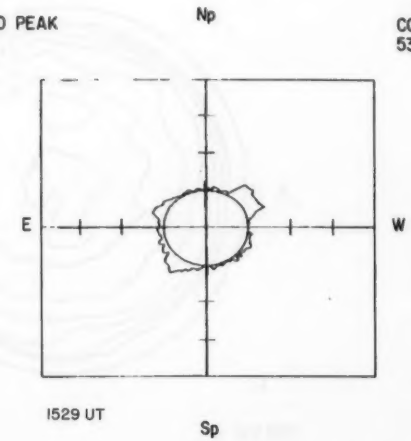


0030 UT

1-8Å FLUX (10^{-6} Wm^{-2})

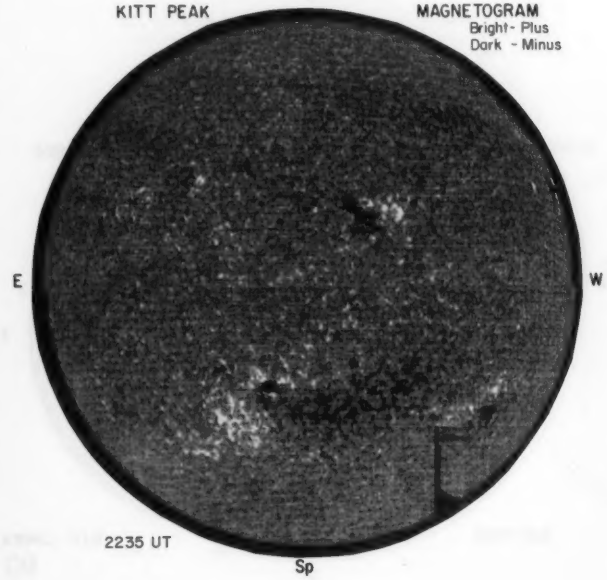
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



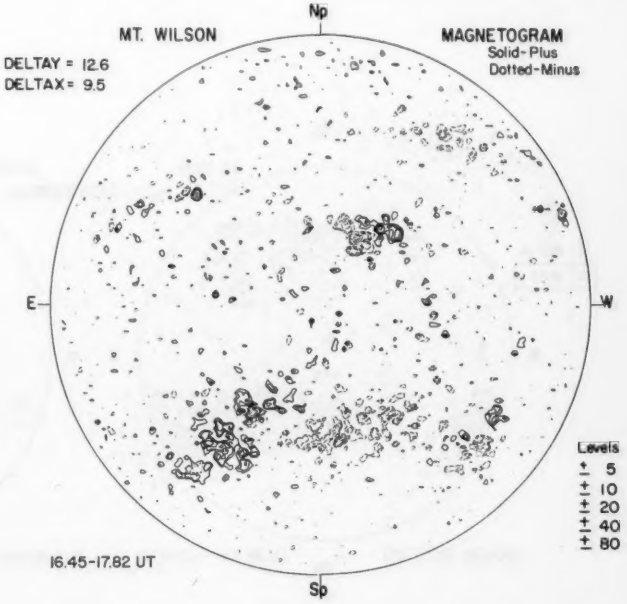
1529 UT

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



2235 UT

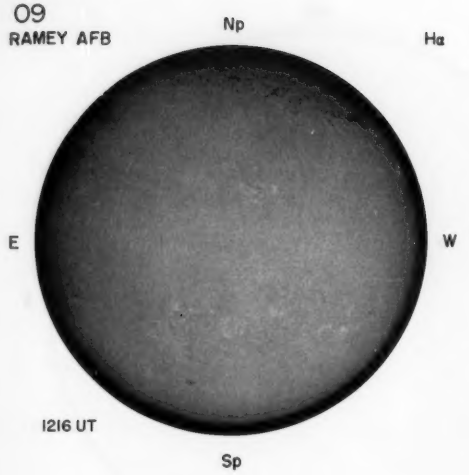
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.6
DELTAX = 9.5



16.45-17.82 UT

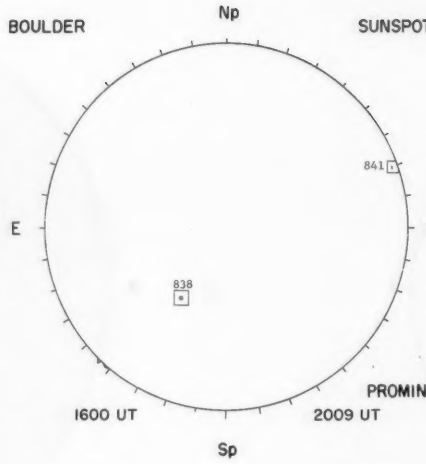
09

RAMEY AFB



1216 UT

Hα BOULDER



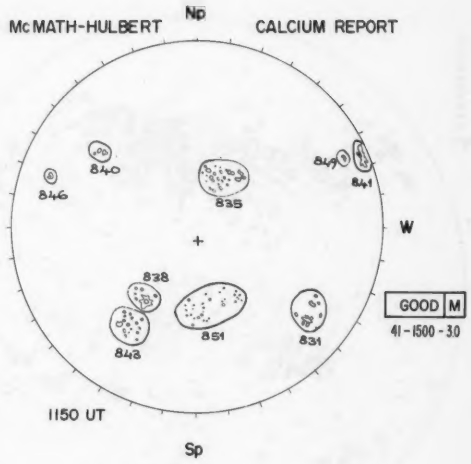
1600 UT

SUNSPOTS

2009 UT

McMATH-HULBERT

CALCIUM REPORT

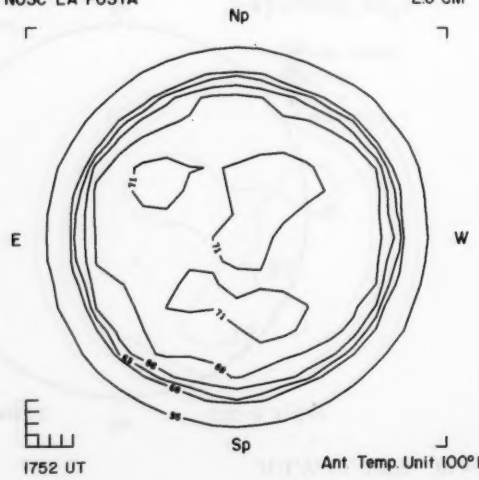


1150 UT

PROMINENCES

NOSC LA POSTA

2.0 CM

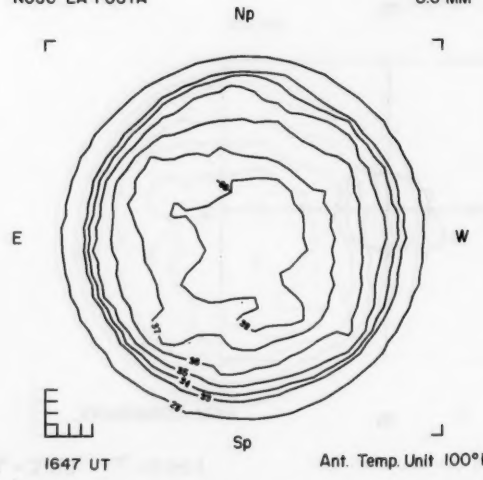


1752 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

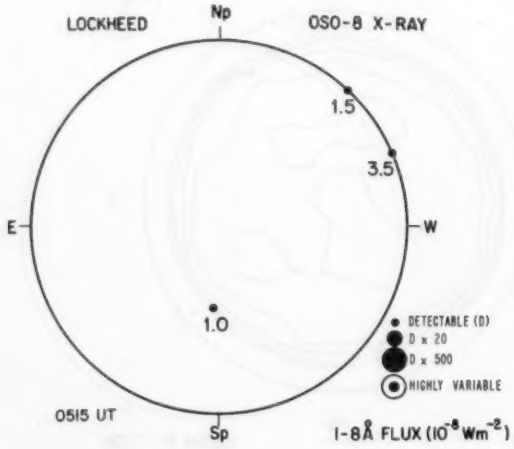


1647 UT

Ant. Temp. Unit 100°K

JULY 10, 1977 (P = 1.34, B_o = 3.85, L_o = 9.98)

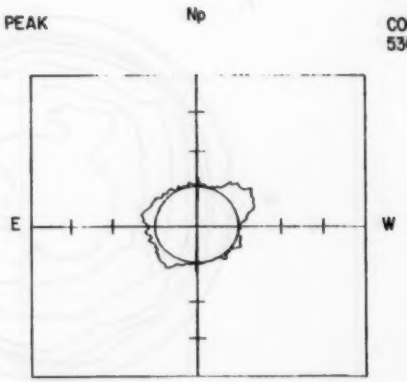
LOCKHEED OSO-8 X-RAY



0515 UT

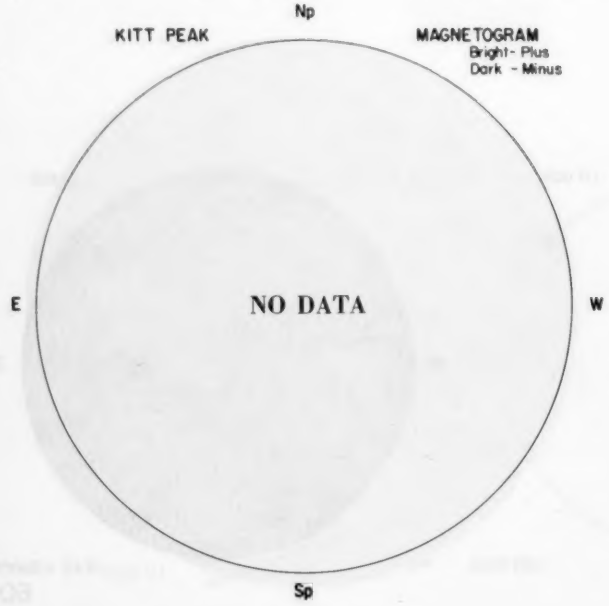
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å

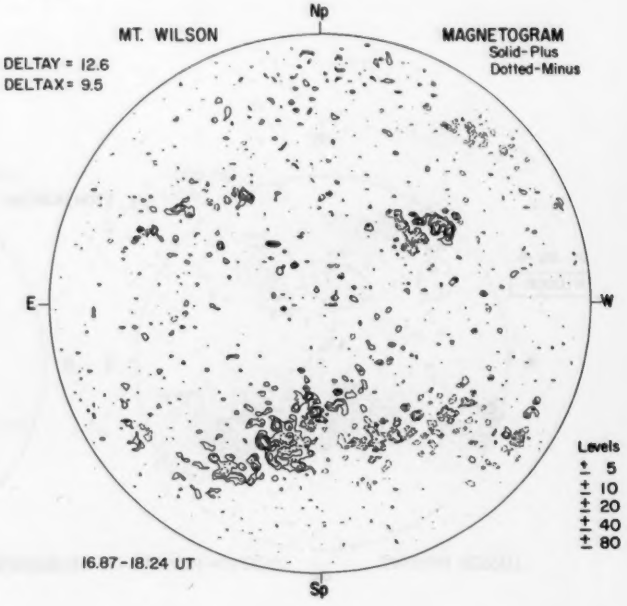


1618 UT

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



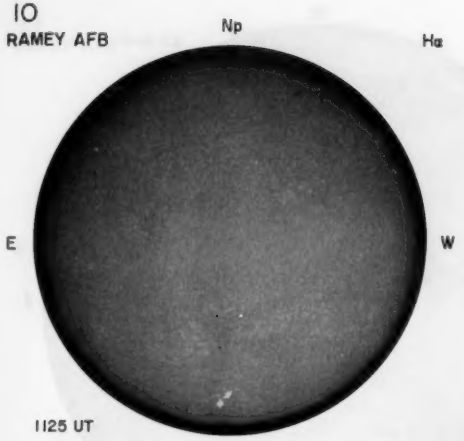
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.6
DELTAX = 9.5



16.87 - 18.24 UT

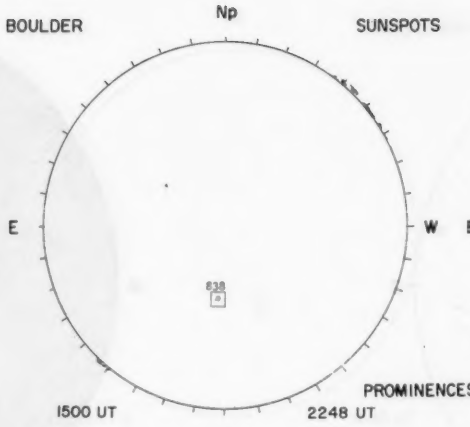
10

RAMEY AFB



1125 UT

Hα BOULDER



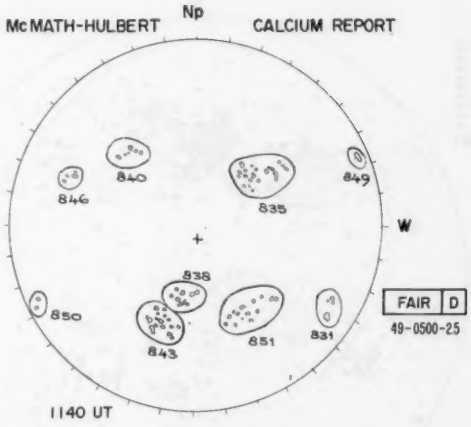
1500 UT

SUNSPOTS

PROMINENCES

2248 UT

McMATH-HULBERT



1140 UT

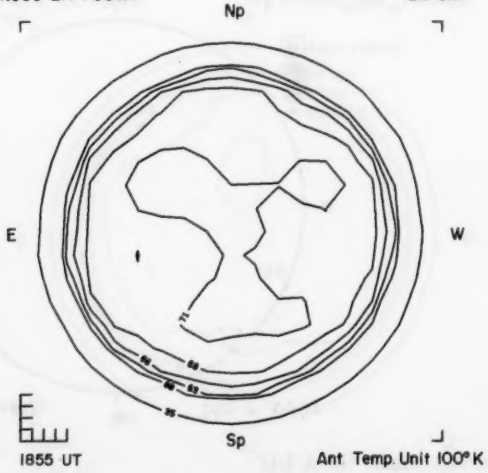
CALCIUM REPORT

FAIR | D

49-0500-25

NOSC LA POSTA

2.0 CM

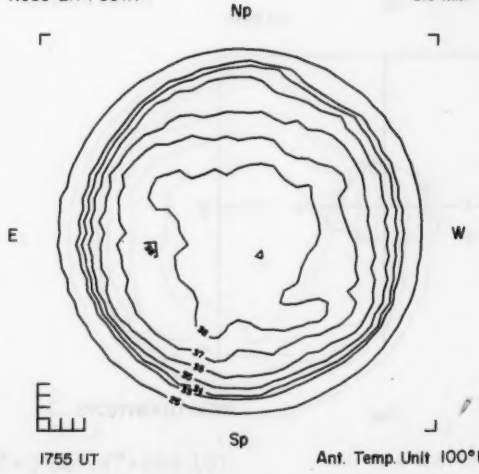


1855 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

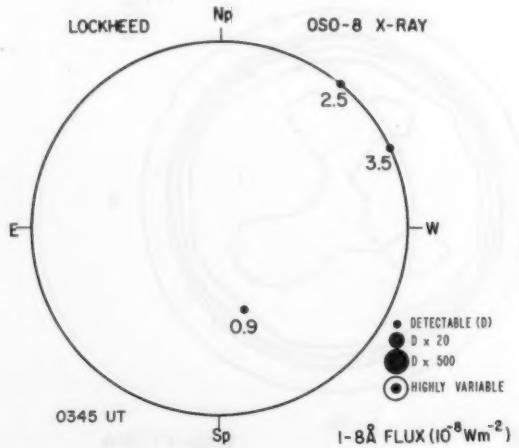


1755 UT

Ant. Temp. Unit 100°K

JULY 11, 1977 (P = 1.79, B_0 = 3.96, L_0 = 356.75)

LOCKHEED OSO-8 X-RAY

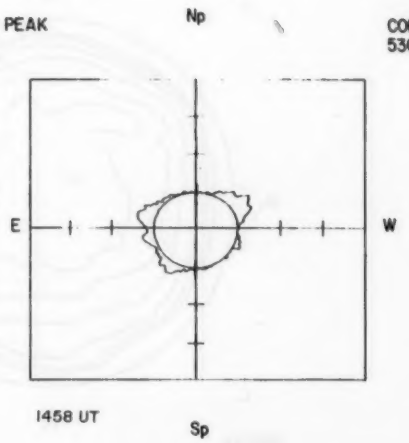


0345 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



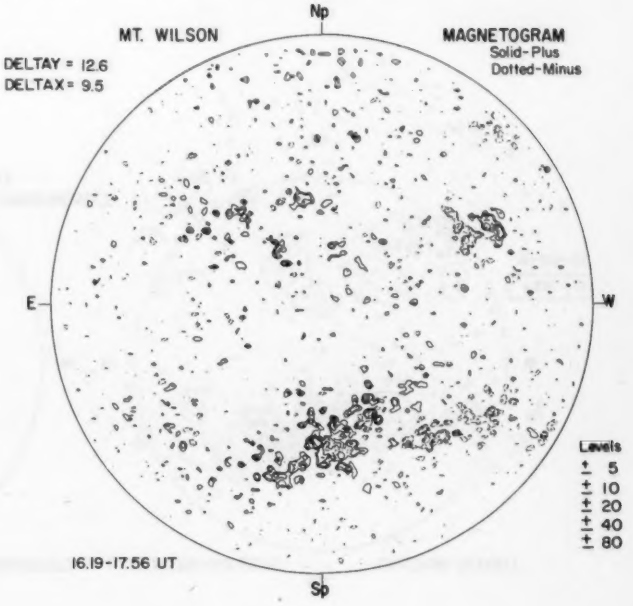
1458 UT

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

1349 UT

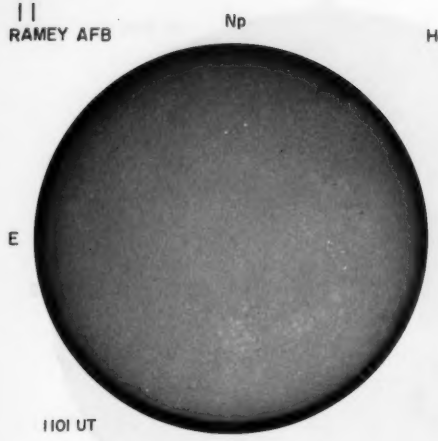
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY = 12.6
DELTAX = 9.5



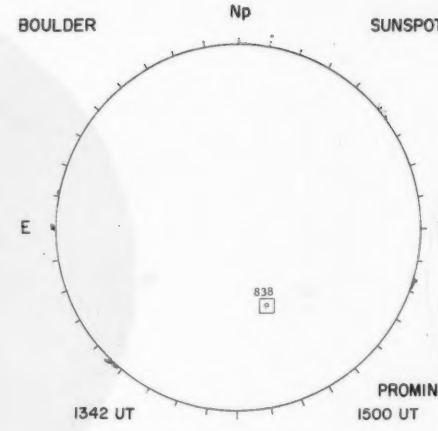
16.19-17.56 UT

RAMEY AFB



1101 UT

Hα BOULDER



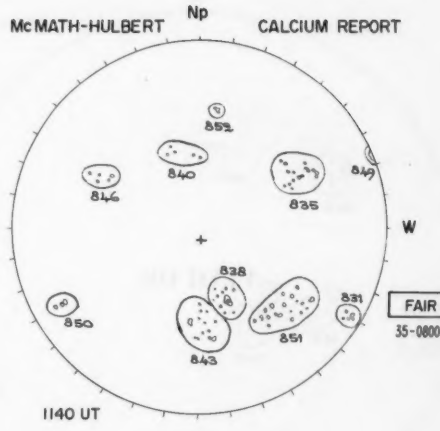
1342 UT

SUNSPOTS

PROMINENCES

1500 UT

McMATH-HULBERT



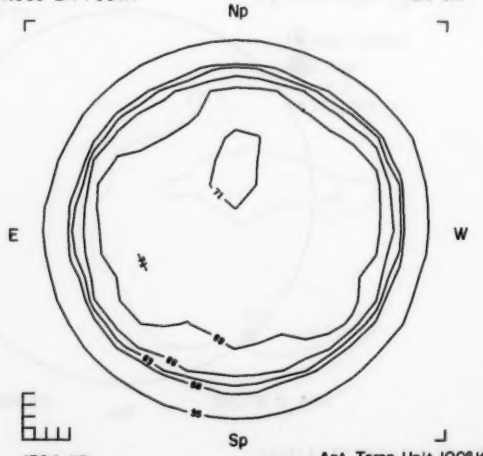
1140 UT

CALCIUM REPORT

FAIR D

35-0800-2.5

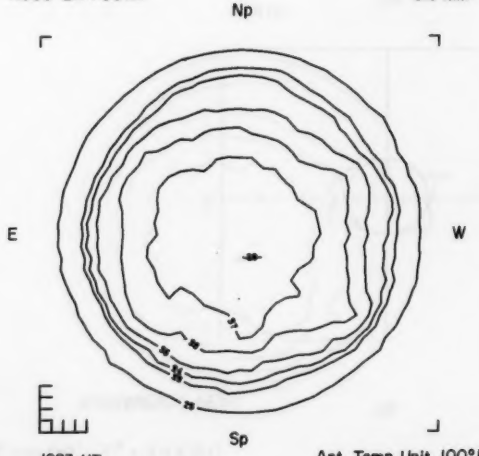
NOSC LA POSTA 2.0 CM



1724 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

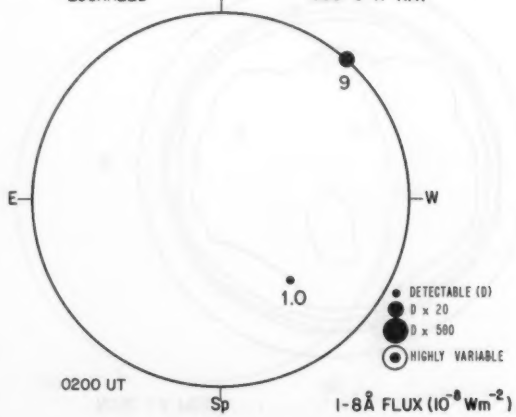


1623 UT

Ant. Temp. Unit 100°K

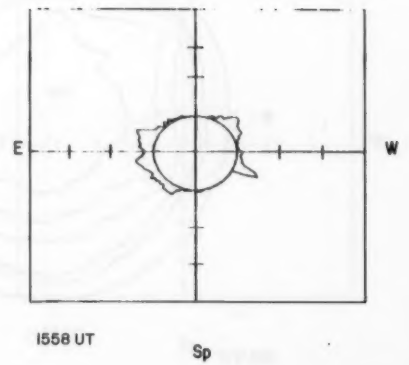
JULY 12, 1977 (P = 2.24, B_0 = 4.06, L_0 = 343.51)

LOCKHEED — OSO-8 X-RAY

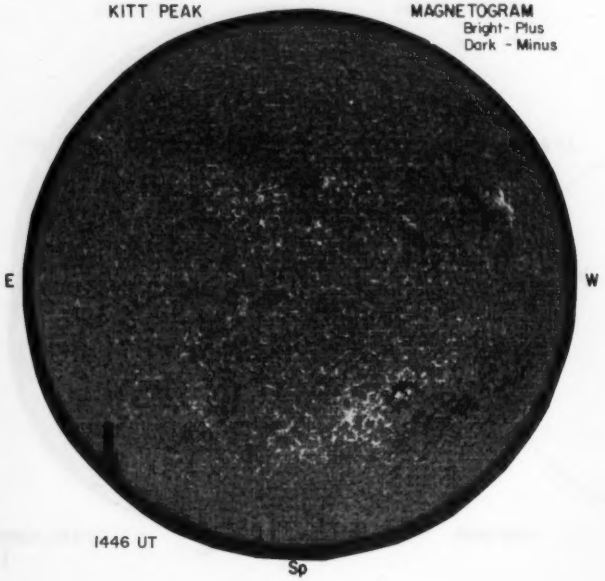


1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK — CORONA (1.15 $R_\odot$) 5303 Å

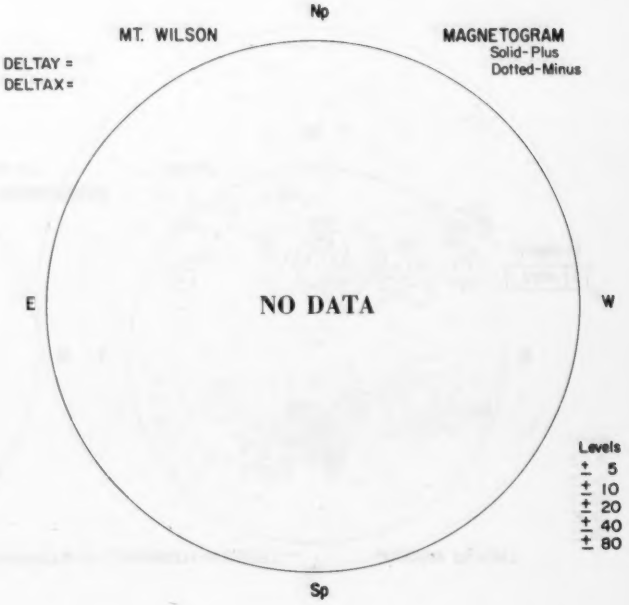


KITT PEAK — MAGNETOGRAM
Bright - Plus
Dark - Minus

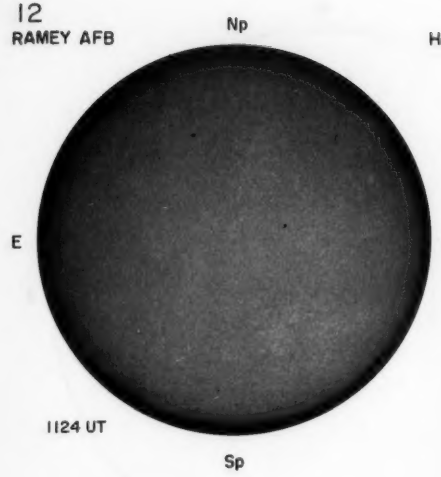


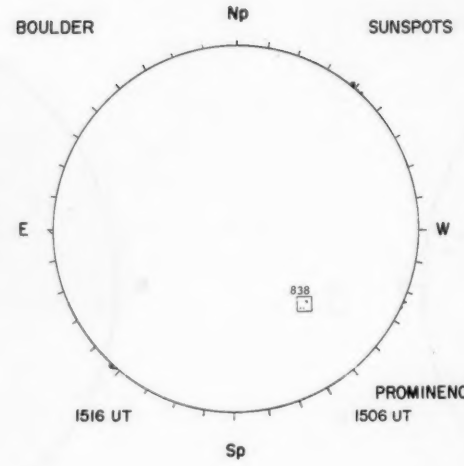
MT. WILSON — MAGNETOGRAM
Solid - Plus
Dotted - Minus

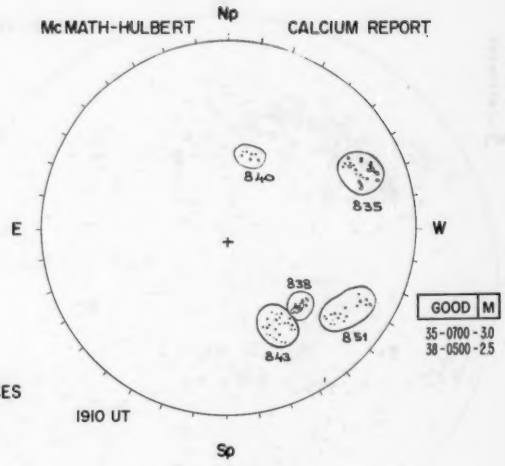
DELTAY =
DELTAX =

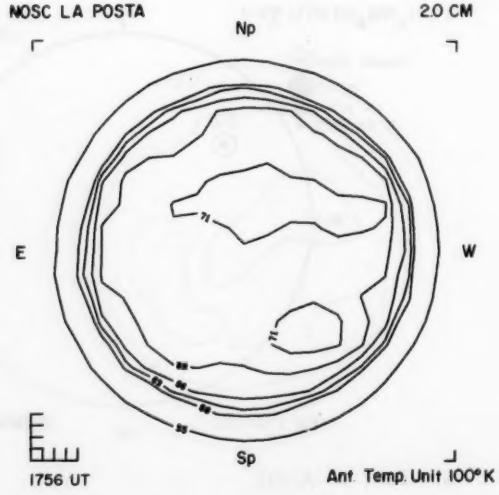


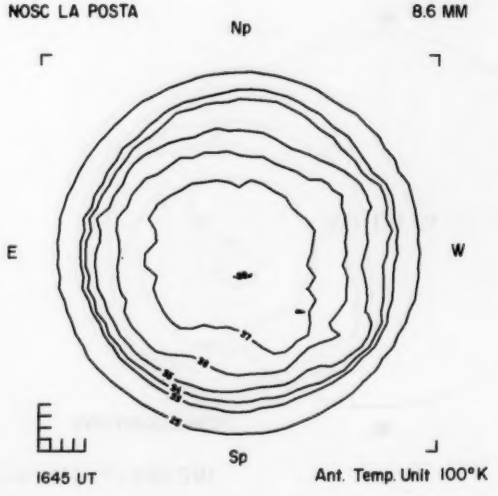
12


RAMEY AFB
Np
Hα
E
W
1124 UT
Sp


BOULDER
Np
SUNSPOTS
838
E
W
1516 UT
PROMINENCES
1506 UT
Sp

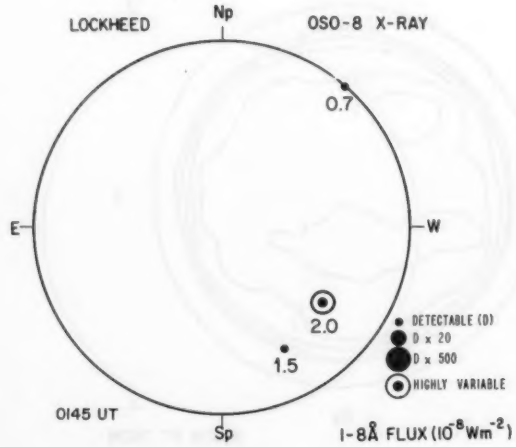

McMATH-HULBERT
Np
CALCIUM REPORT
840
835
838
843
851
E
W
GOOD M
35-0700-3.0
38-0500-2.5
1910 UT
Sp


NOSC LA POSTA
2.0 CM
Np
E
W
Sp
1756 UT
Ant. Temp. Unit 100°K


NOSC LA POSTA
8.6 MM
Np
E
W
Sp
1645 UT
Ant. Temp. Unit 100°K

JULY 13, 1977 (P = 2.68, B_o = 4.16, L_o = 330.28)

LOCKHEED OSO-8 X-RAY

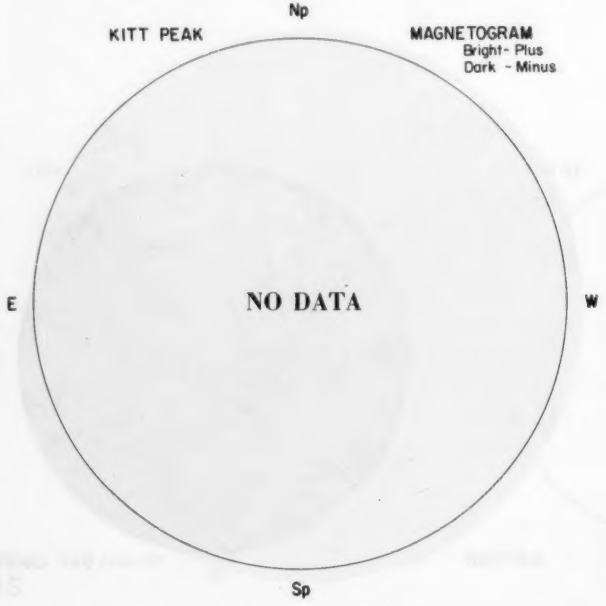


0145 UT

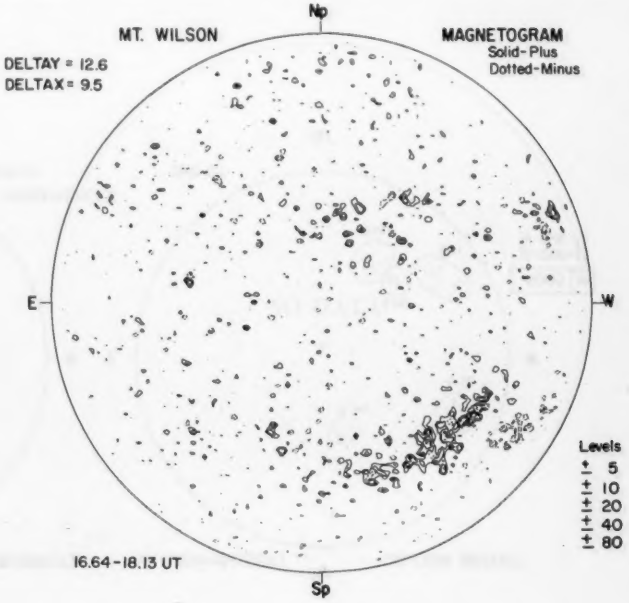
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



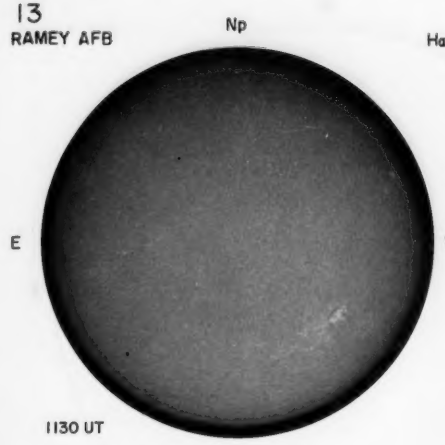
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.6
DELTAX = 9.5



16.64 - 18.13 UT

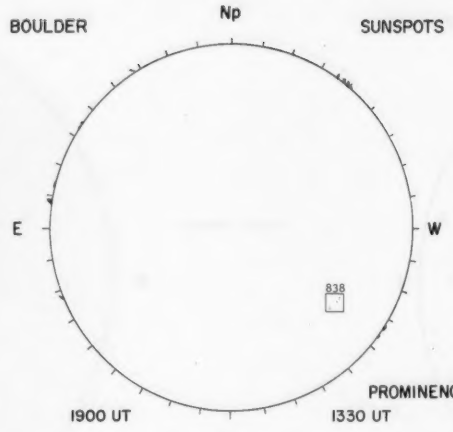
13

RAMEY AFB



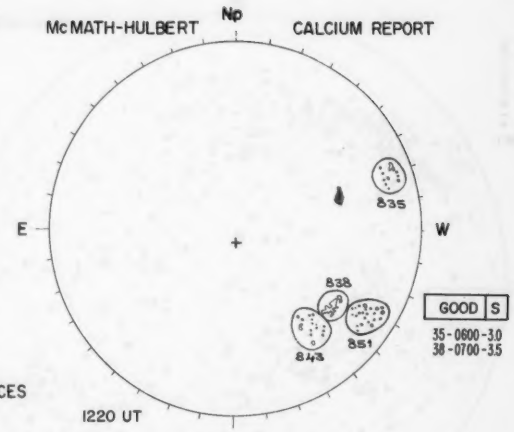
1130 UT

Hα BOULDER



1900 UT

SUNSPOTS



GOOD | S

35 - 0600 - 3.0
38 - 0700 - 3.5

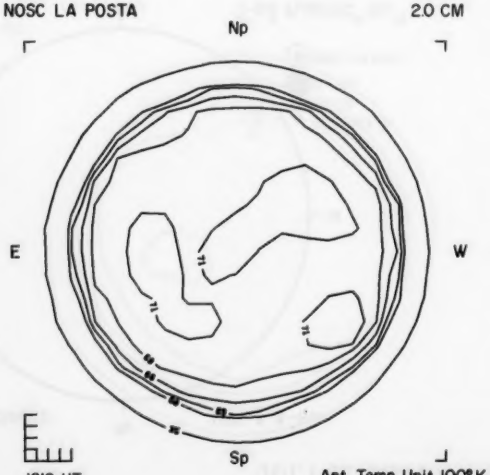
1330 UT

PROMINENCES

1220 UT

McMATH-HULBERT CALCIUM REPORT

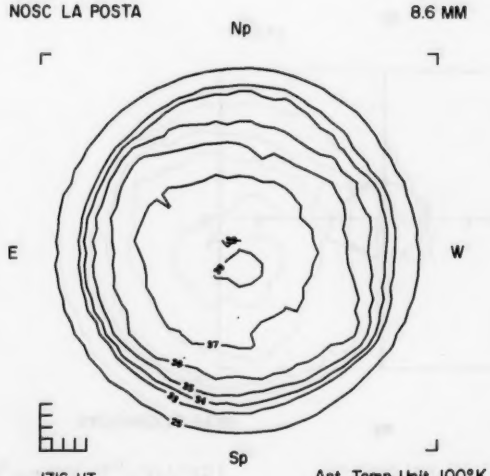
NOSC LA POSTA 2.0 CM



1819 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM



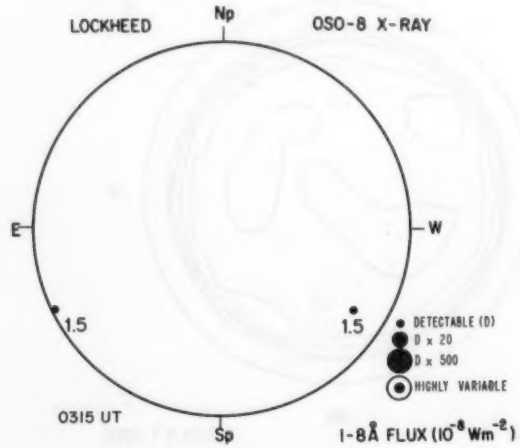
1716 UT

Ant. Temp. Unit 100°K

57
Jul 77

JULY 14, 1977 (P = 3.13, B_o = 4.25, L_o = 317.05)

LOCKHEED OSO-8 X-RAY

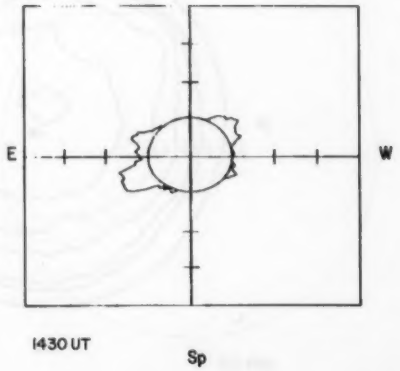


0315 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

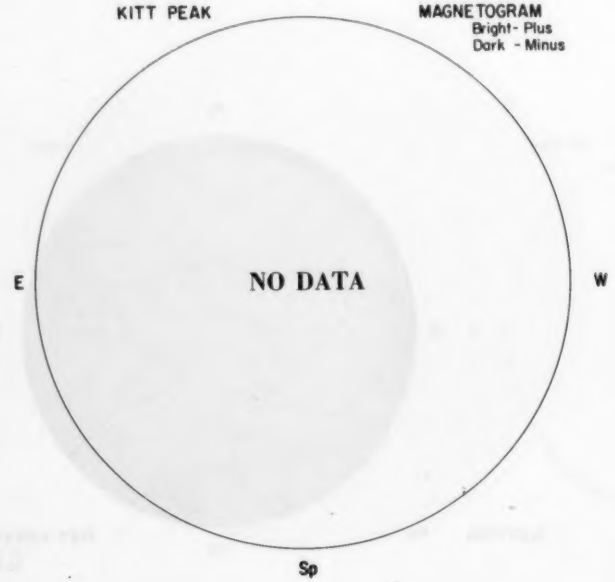
CORONA (1.15 $R_\odot$)
5303 Å



1430 UT

KITT PEAK

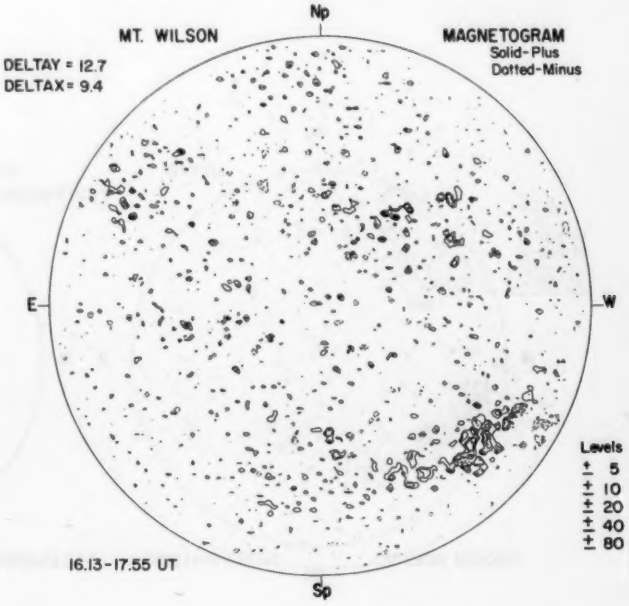
MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON

DELTAY = 12.7
DELTAX = 9.4

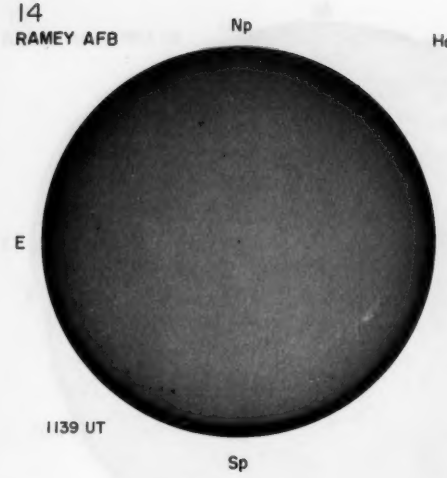
MAGNETOGRAM
Solid - Plus
Dotted - Minus



16.13 - 17.55 UT

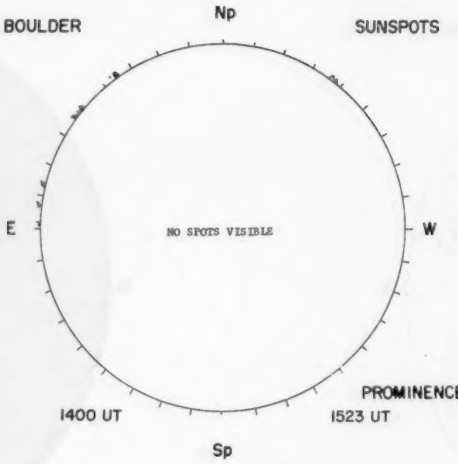
14

RAMEY AFB



1139 UT

Hα BOULDER

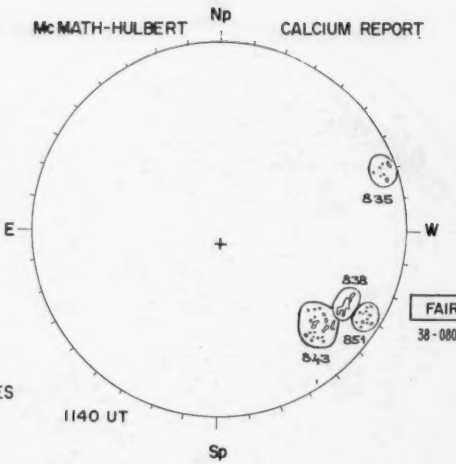


1400 UT

SUNSPOTS

1523 UT

McMATH-HULBERT



1140 UT

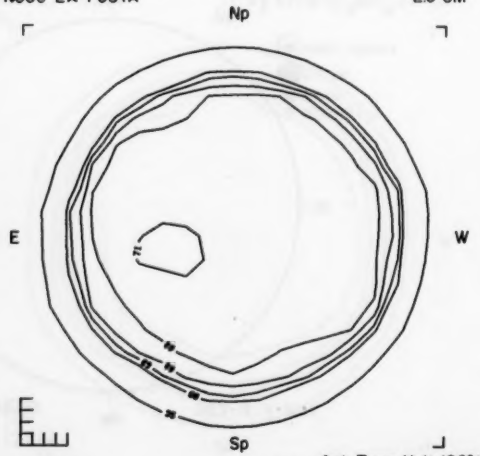
CALCIUM REPORT

FAIR | S

38-0800-30

PROMINENCES

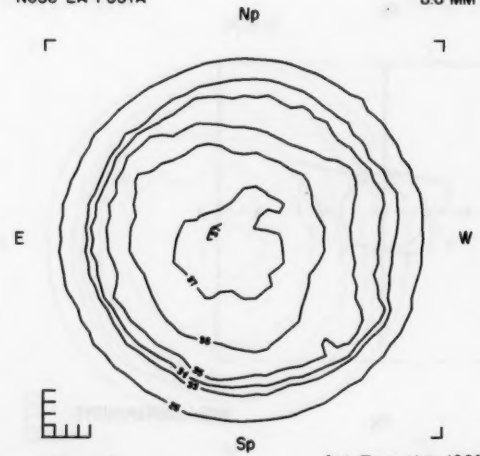
NOSC LA POSTA 2.0 CM



1748 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

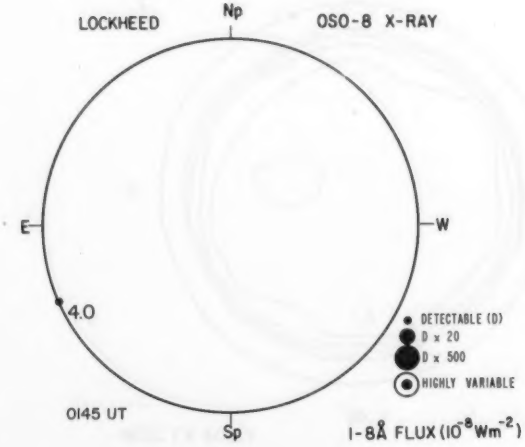


1638 UT

Ant. Temp. Unit 100°K

JULY 15, 1977 (P = 3.58, B_0 = 4.35, L_0 = 303.82)

LOCKHEED OSO-8 X-RAY

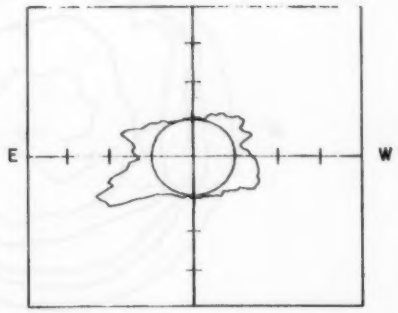


0145 UT

1-8Å FLUX (10^{-8} Wm^{-2})

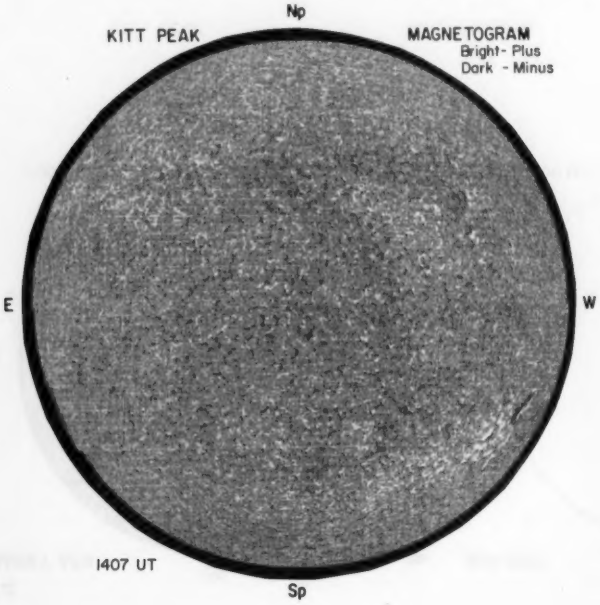
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



1429 UT

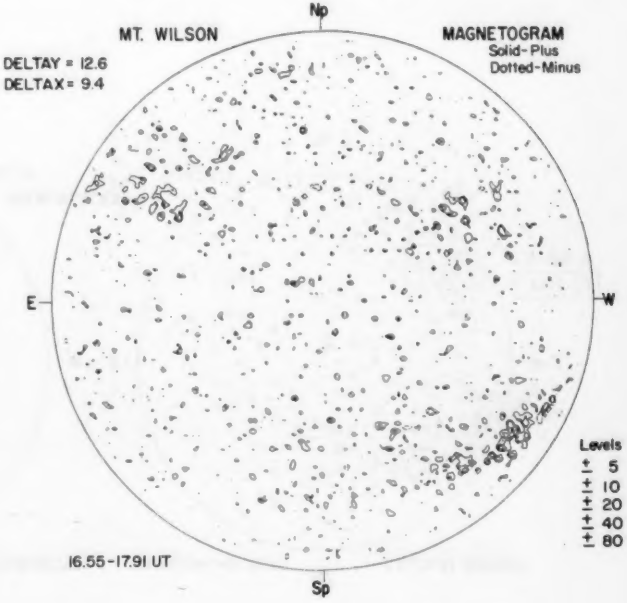
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1407 UT

MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

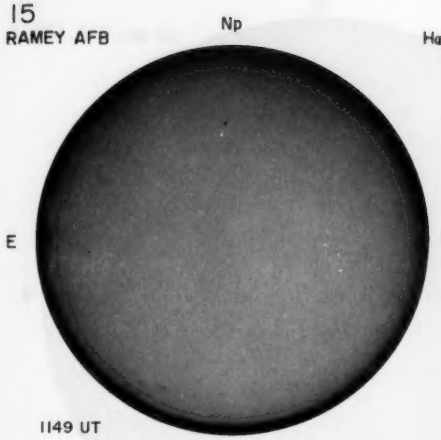
DELTAY = 12.6
DELTAX = 9.4



16.55-17.91 UT

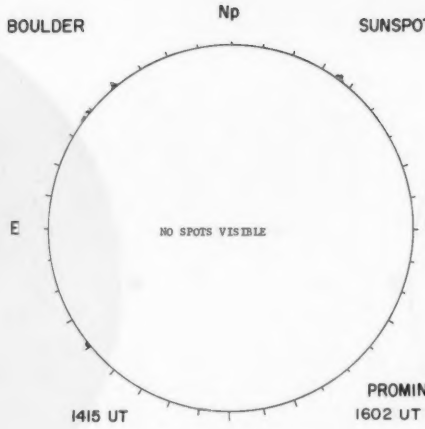
15

RAMEY AFB



1149 UT

Hα BOULDER



1415 UT

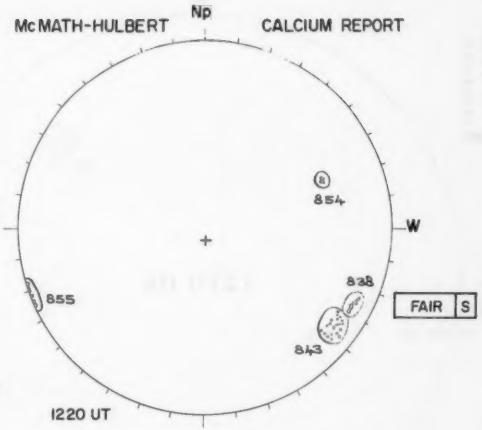
SUNSPOTS

PROMINENCES

1602 UT

McMATH-HULBERT

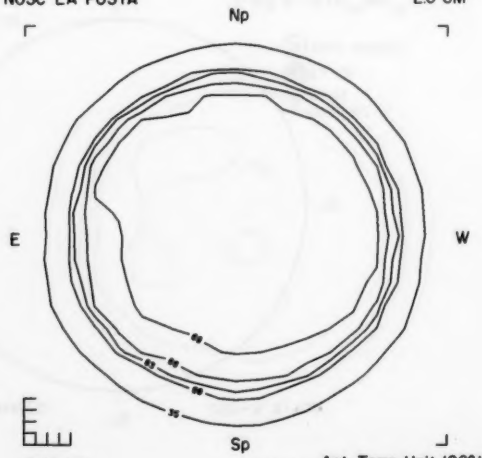
CALCIUM REPORT



FAIR S

1220 UT

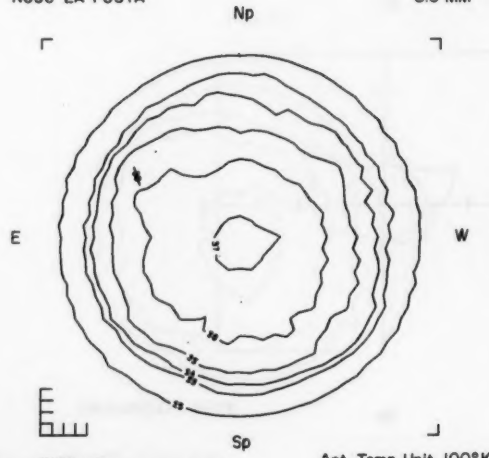
NOSC LA POSTA 2.0 CM



1644 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

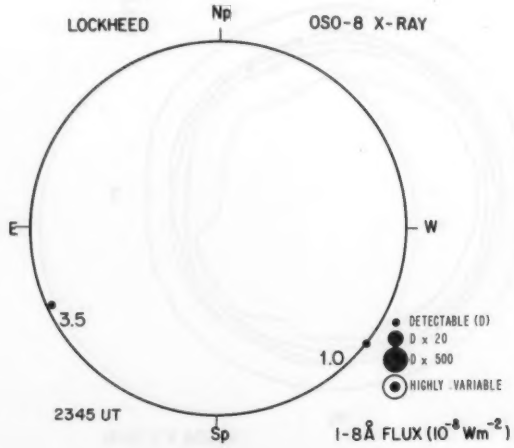


1748 UT

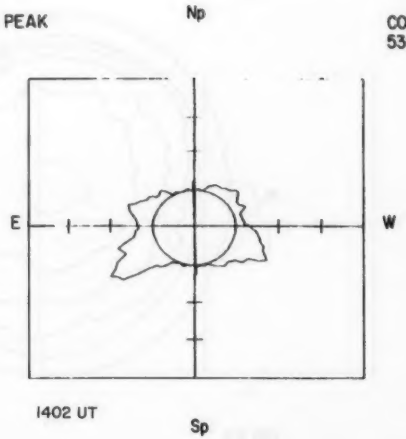
Ant. Temp. Unit 100°K

JULY 16, 1977 (P = 4.02, B_0 = 4.45, L_0 = 290.58)

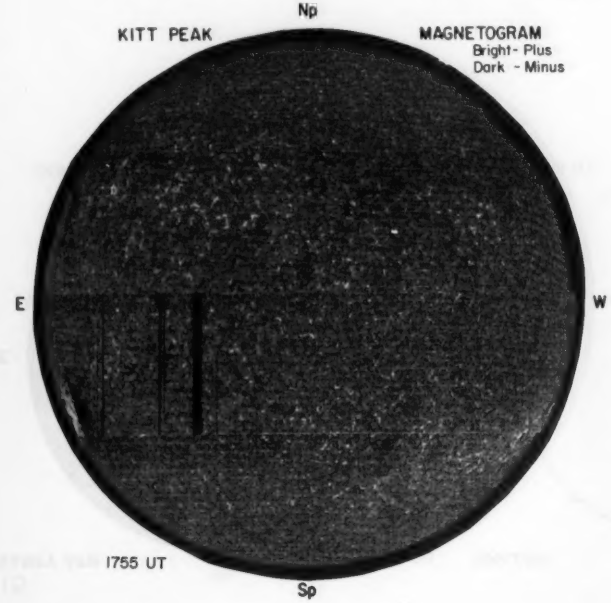
LOCKHEED OSO-8 X-RAY



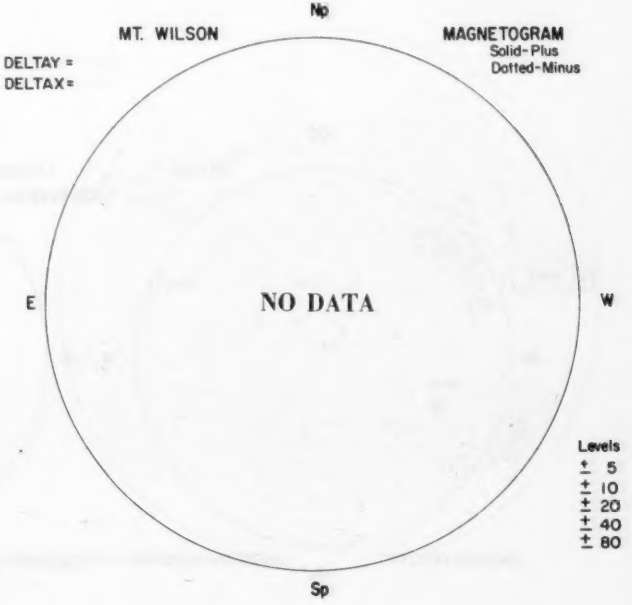
SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

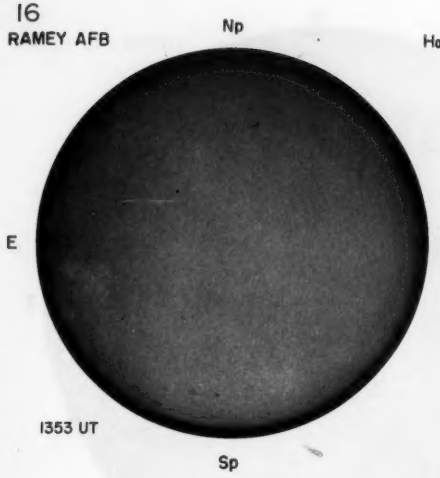


MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY =
DELTAX =



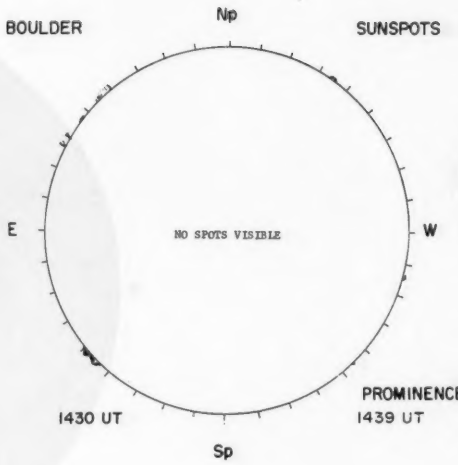
16

RAMEY AFB



1353 UT

Hα BOULDER



1430 UT

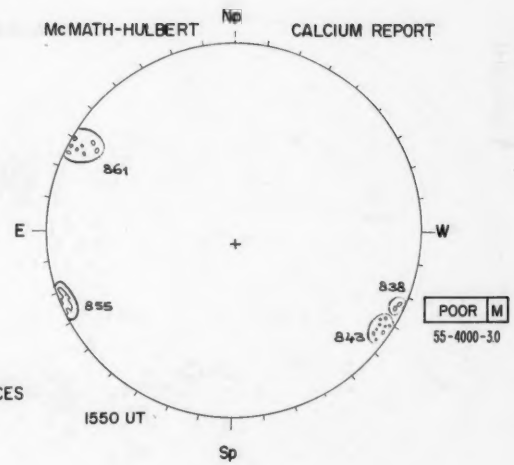
SUNSPOTS

PROMINENCES

1439 UT

McMATH-HULBERT

CALCIUM REPORT



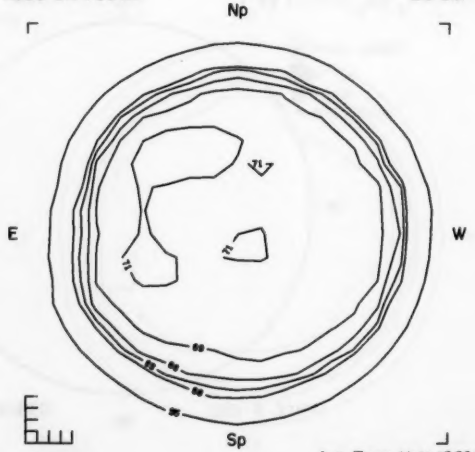
1550 UT

POOR | M

55-4000-3.0

NOSC LA POSTA

2.0 CM

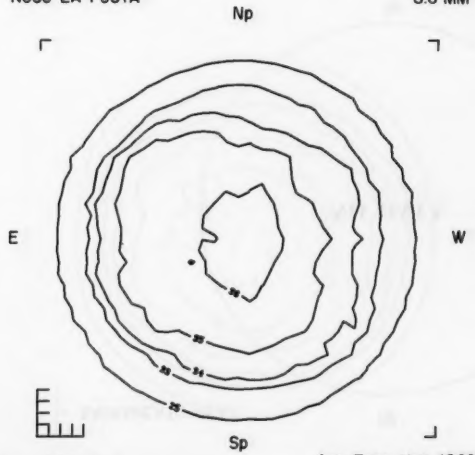


1747 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM



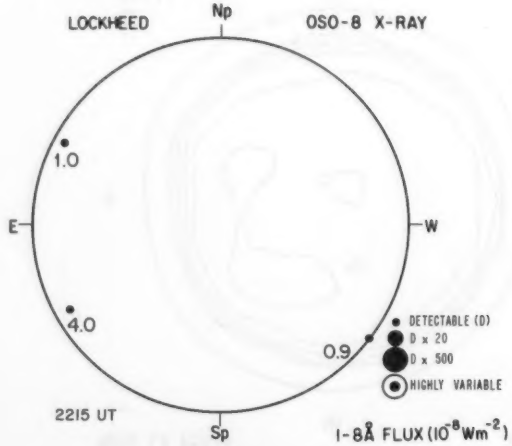
1632 UT

Ant. Temp. Unit 100°K

63
Jul 77

JULY 17, 1977 (P = 4.46, B_o = 4.54, L_o = 277.35)

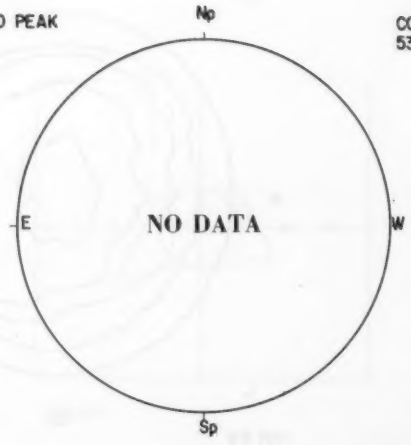
LOCKHEED — OSO-8 X-RAY



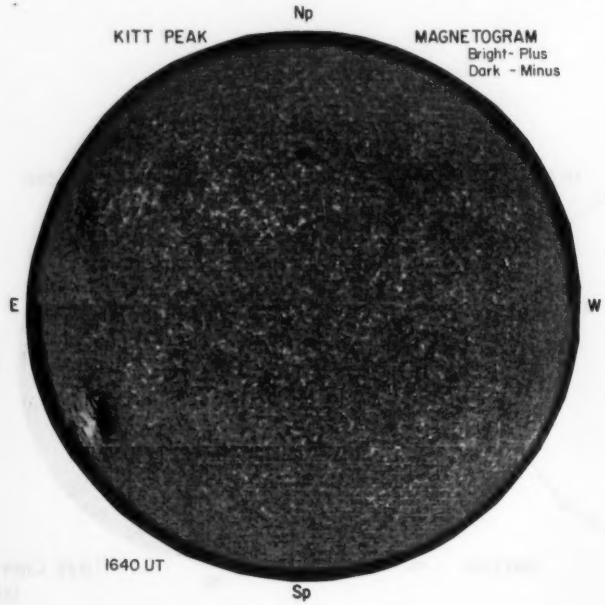
2215 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK — CORONA (1.15 R_o) 5303 Å

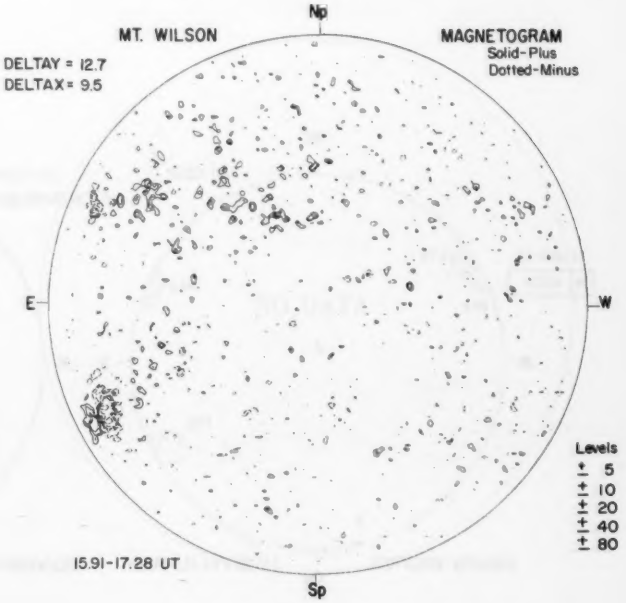


KITT PEAK — MAGNETOGRAM
Bright - Plus
Dark - Minus



1640 UT

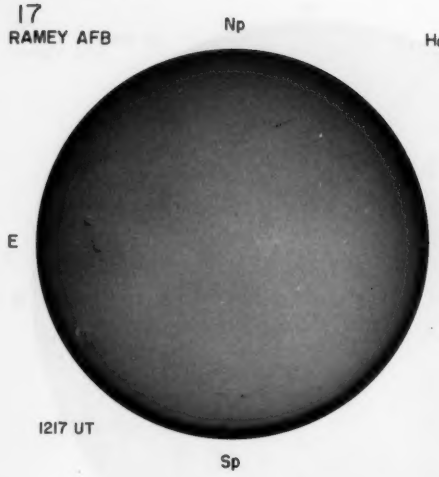
MT. WILSON — MAGNETOGRAM
Solid-Plus
Dotted-Minus
DELTAY = 12.7
DELTAX = 9.5



1591-1728 UT

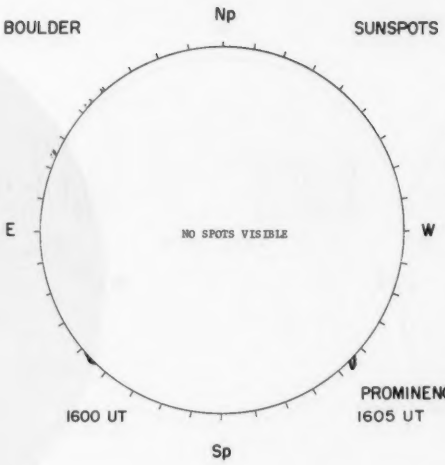
17

RAMEY AFB



1217 UT

BOULDER SUNSPOTS

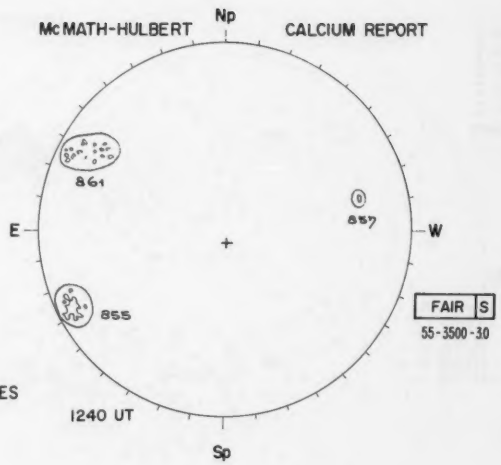


1600 UT

PROMINENCES

1605 UT

McMATH-HULBERT CALCIUM REPORT

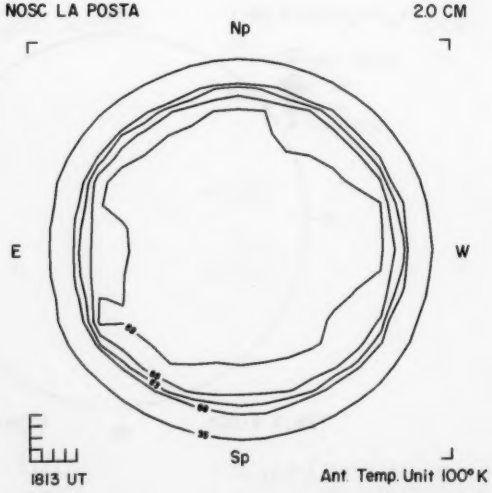


1240 UT

FAIR S

55-3500-30

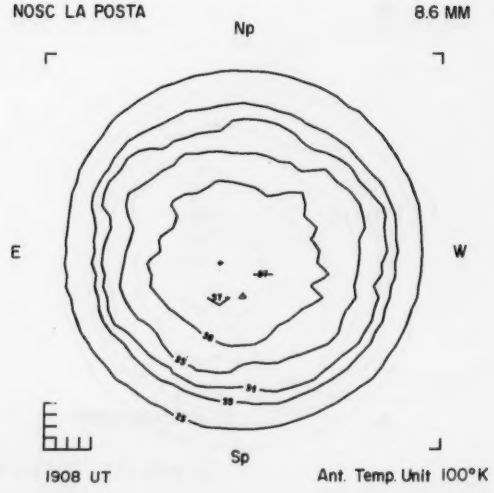
NOSC LA POSTA 2.0 CM



1813 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM



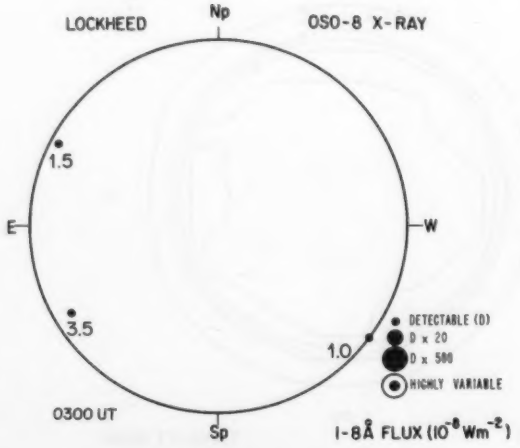
1908 UT

Ant. Temp. Unit 100°K

65
Jul 77

JULY 18, 1977 (P = 4.90, B_o = 4.63, L_o = 264.12)

LOCKHEED — OSO-8 X-RAY

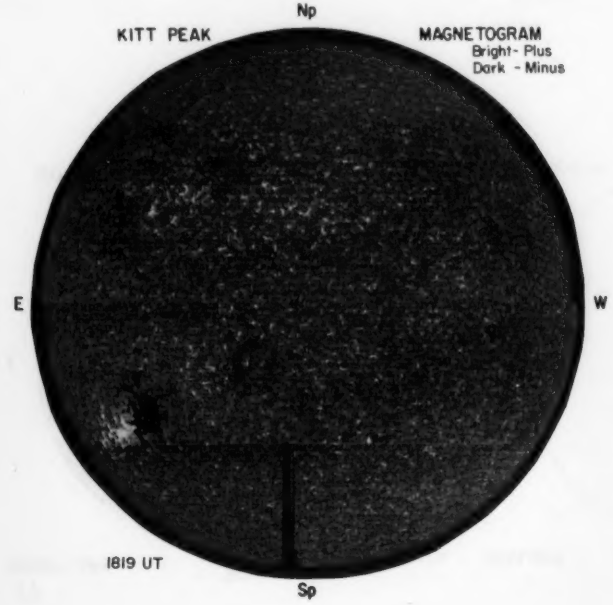


0300 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK — CORONA (1.15 $R_\odot$) 5303 Å

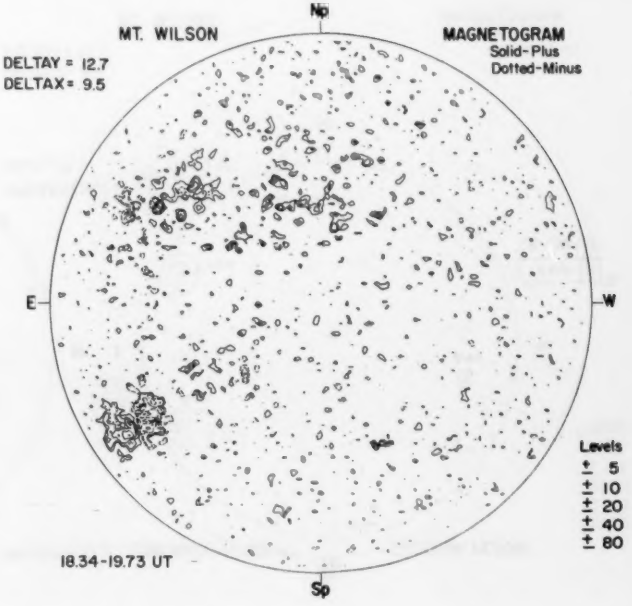
KITT PEAK — MAGNETOGRAM
Bright - Plus
Dark - Minus



1819 UT

MT. WILSON — MAGNETOGRAM
Solid - Plus
Dotted - Minus

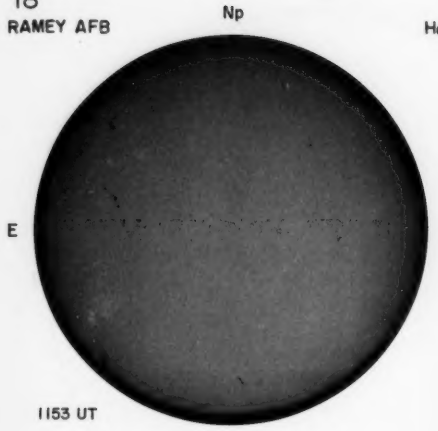
DELTAY = 12.7
DELTAX = 9.5



18.34-19.73 UT

18

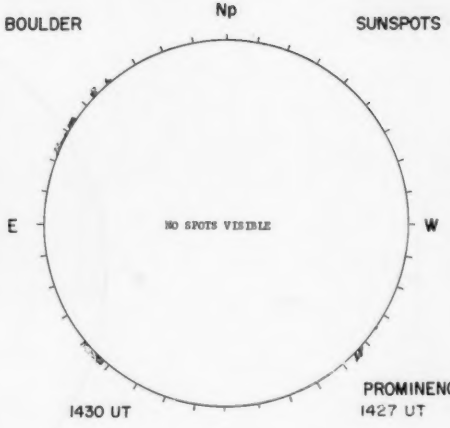
RAMEY AFB



1153 UT

Hα

BOULDER



1430 UT

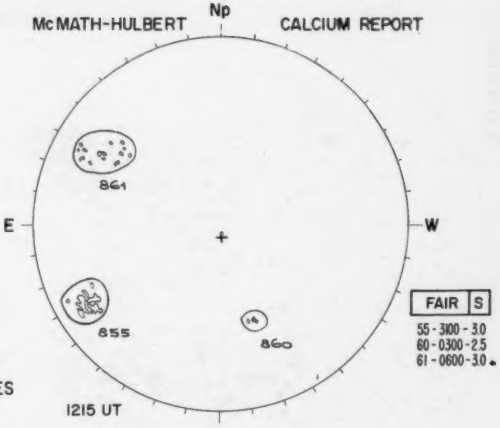
SUNSPOTS

PROMINENCES

1427 UT

McMATH-HULBERT

CALCIUM REPORT



1215 UT

FAIR | S

55 - 3100 - 3.0
60 - 0300 - 2.5
61 - 0600 - 3.0

NOSC LA POSTA

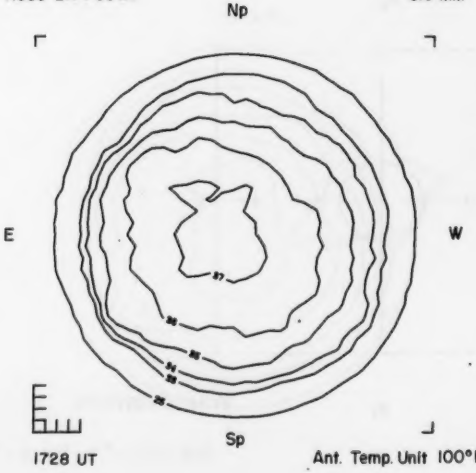
2.0 CM

---- UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM



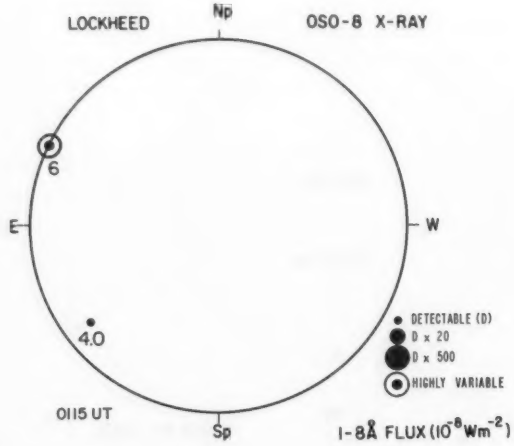
1728 UT

Ant. Temp. Unit 100°K

67
Jul 77

JULY 19, 1977 (P = 5.34, B_o = 4.73, L_o = 250.89)

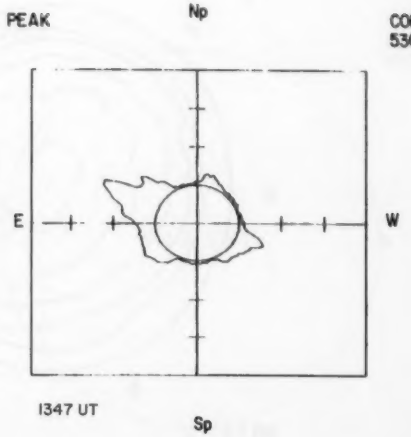
LOCKHEED OSO-8 X-RAY



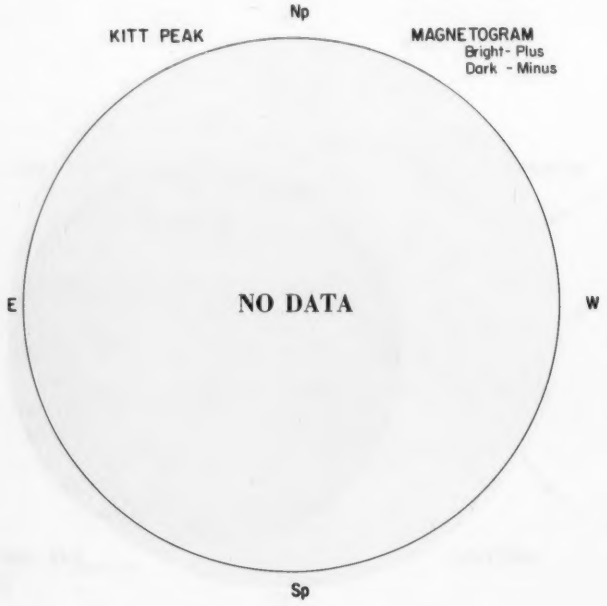
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

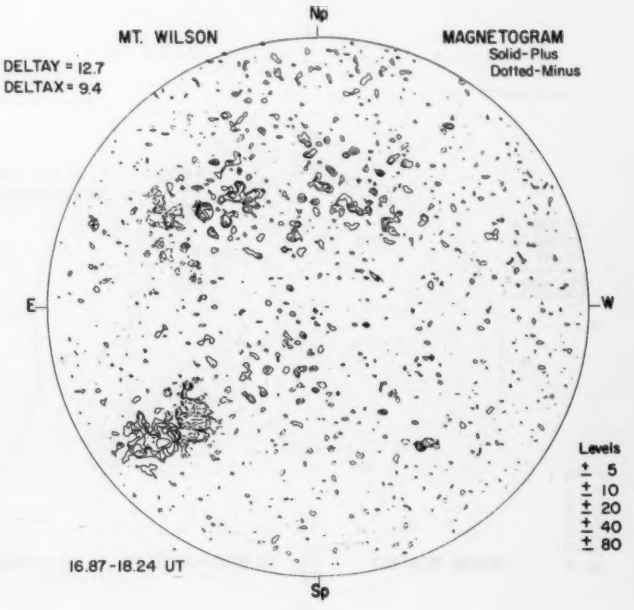
CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

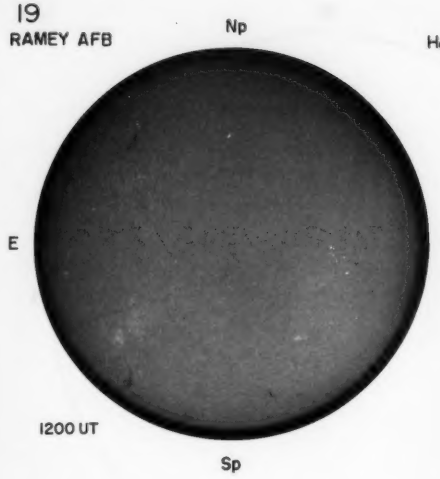


MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.7
DELTAX = 9.4



19

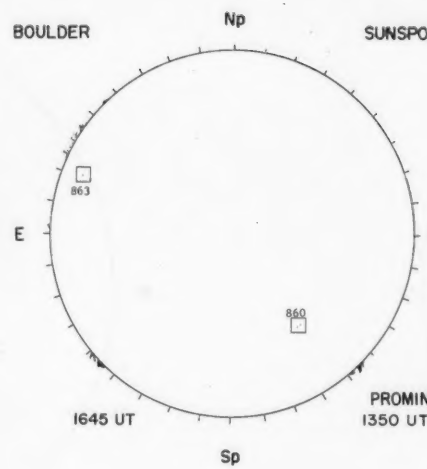
RAMEY AFB



1200 UT

Hα

BOULDER



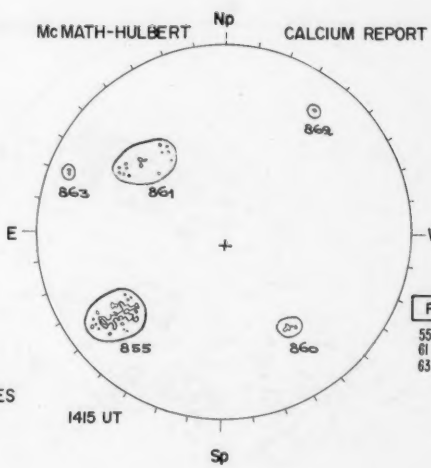
1645 UT

SUNSPOTS

PROMINENCES

1350 UT

McMATH-HULBERT



1415 UT

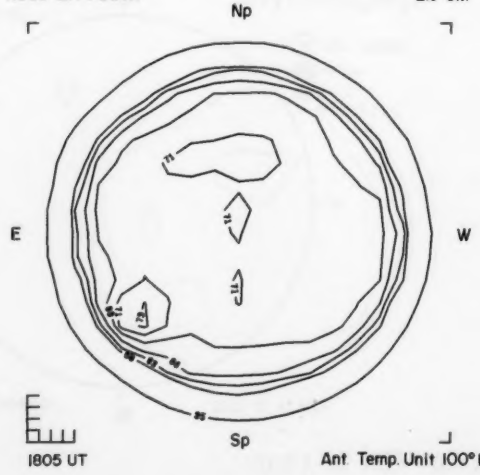
CALCIUM REPORT

POOR	M

55-3000-2.5
61-0500-2.5
63-0100-2.5

NOSC LA POSTA

2.0 CM

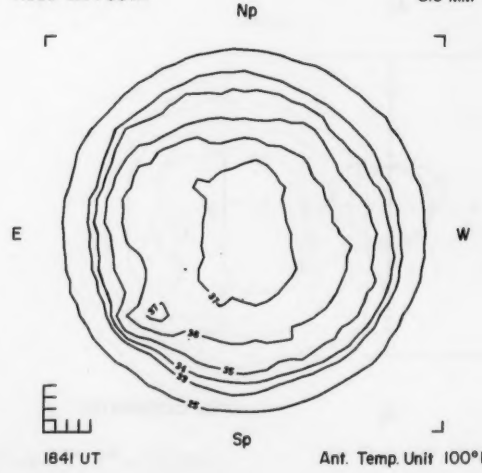


1805 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

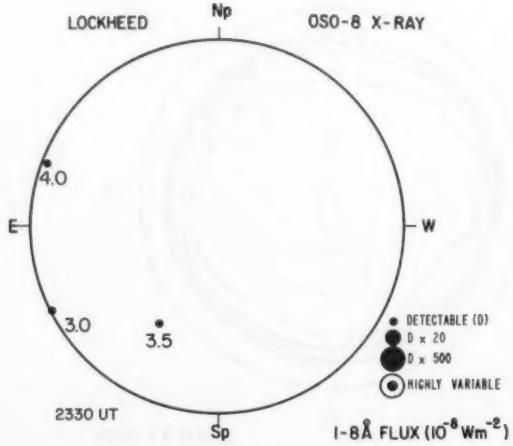


1841 UT

Ant. Temp. Unit 100°K

JULY 20, 1977 (P = 5.78, B_o = 4.82, L_o = 237.66)

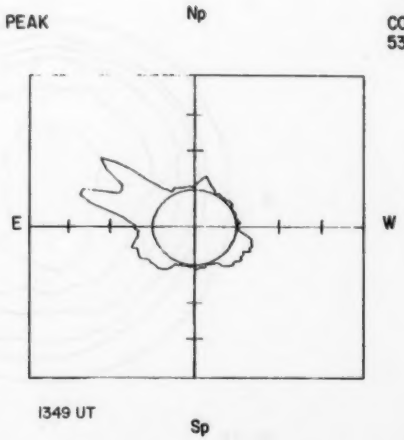
LOCKHEED OSO-8 X-RAY



2330 UT

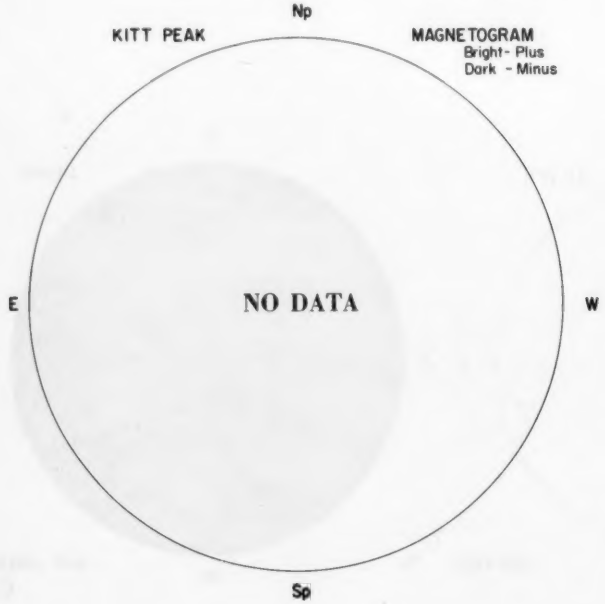
1-8Å FLUX (10^{-6} Wm^{-2})

SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å

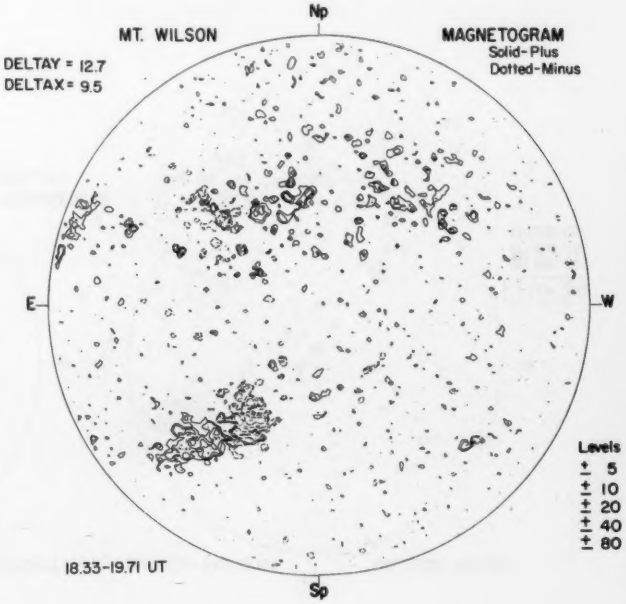


1349 UT

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



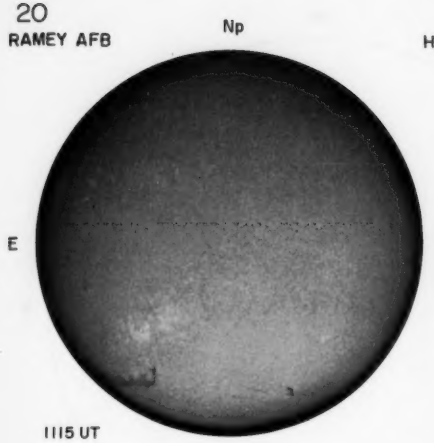
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.7
DELTAX = 9.5



18.33-19.71 UT

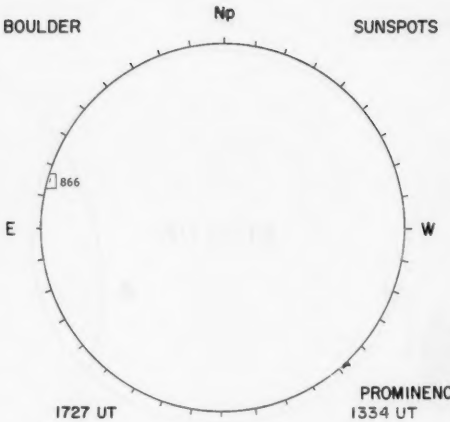
20

RAMEY AFB



1115 UT

Hα BOULDER



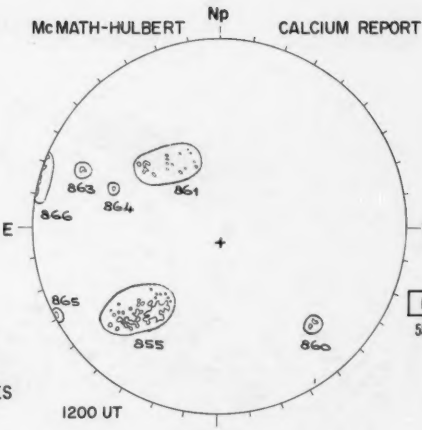
1727 UT

SUNSPOTS

PROMINENCES

1334 UT

McMATH-HULBERT



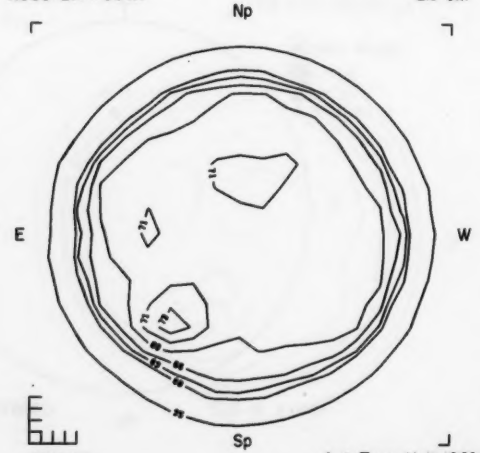
1200 UT

CALCIUM REPORT

POOR | S

55-2800-2.5

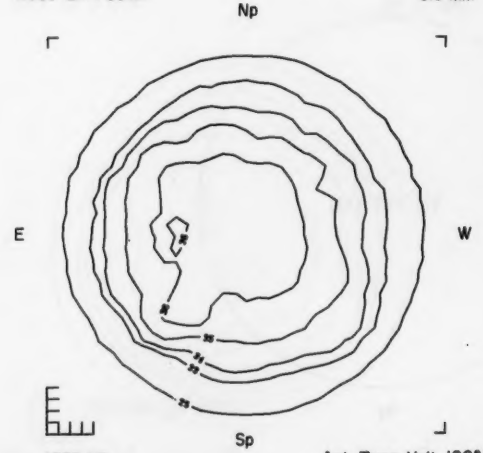
NOSC LA POSTA 2.0 CM



1655 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM



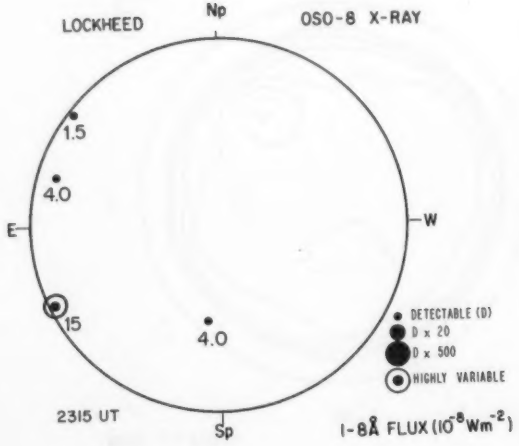
1555 UT

Ant. Temp. Unit 100°K

71
Jul 77

JULY 21, 1977 (P = 6.21, B_o = 4.91, L_o = 224.43)

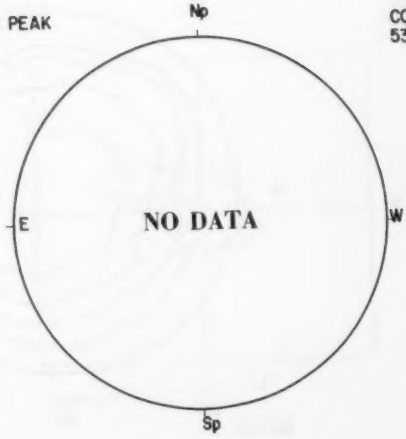
LOCKHEED — OSO-8 X-RAY



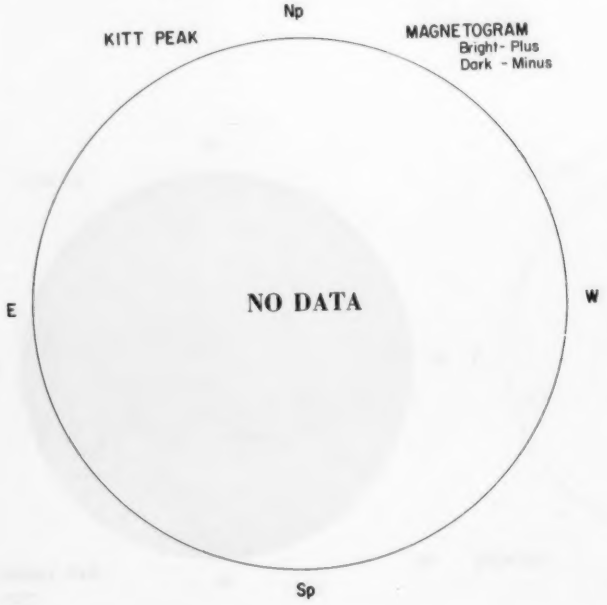
2315 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK — CORONA (1.15 $R_\odot$) 5303 Å

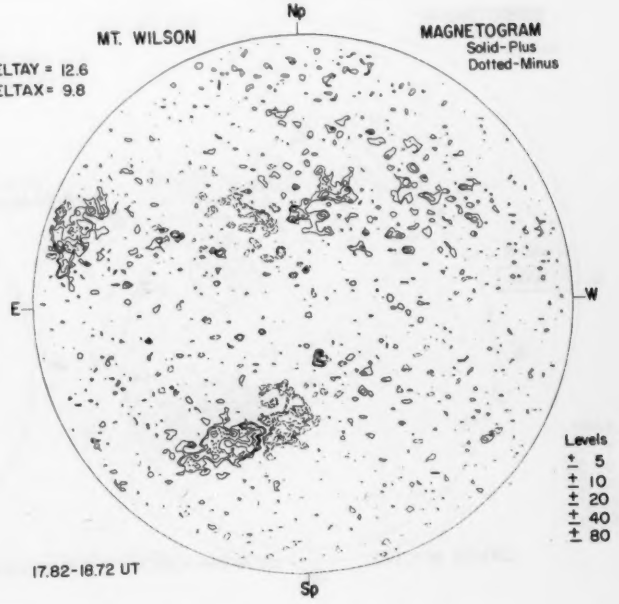


KITT PEAK — MAGNETOGRAM Bright - Plus Dark - Minus



MT. WILSON — MAGNETOGRAM Solid - Plus Dotted - Minus

DELTAY = 12.6
DELTAX = 9.8



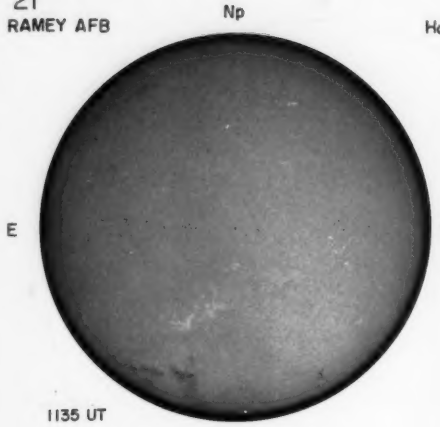
17.82-18.72 UT

Sp

Sp

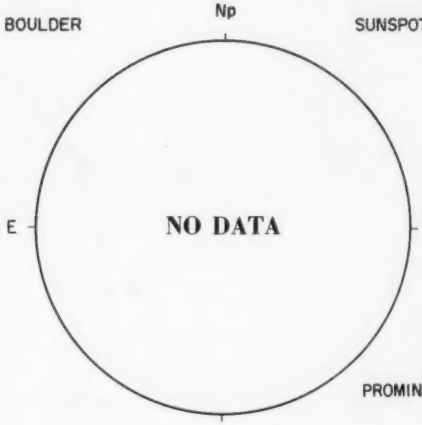
21

RAMEY AFB



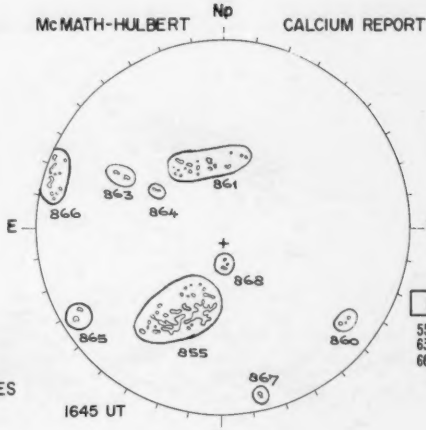
1135 UT

Hα BOULDER



PROMINENCES

SUNSPOTS McMATH-HULBERT

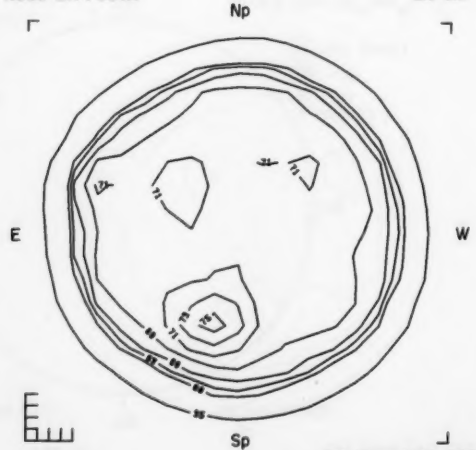


1645 UT

CALCIUM REPORT

FAIR	M
55-3000-2.5	
63-0200-2.5	
66-1000-2.5	

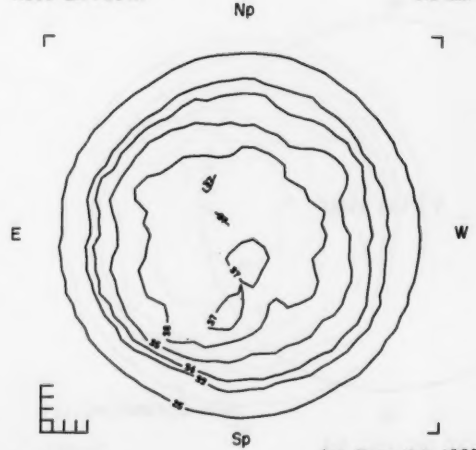
NOSC LA POSTA 2.0 CM



1835 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

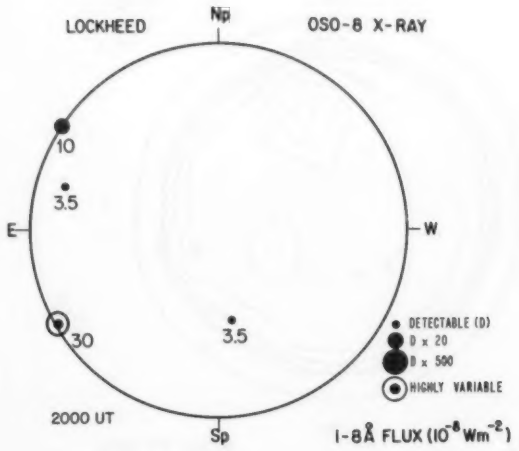


1721 UT

Ant. Temp. Unit 100°K

JULY 22, 1977 (P = 6.64, B_o = 5.00, L_o = 211.20)

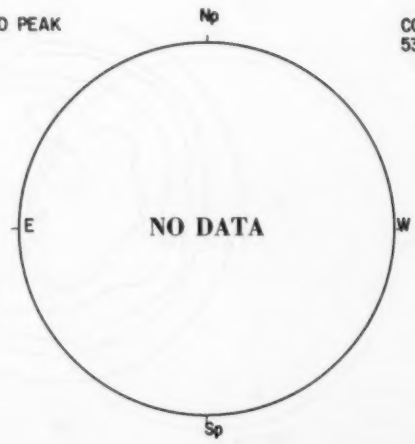
LOCKHEED OSO-8 X-RAY



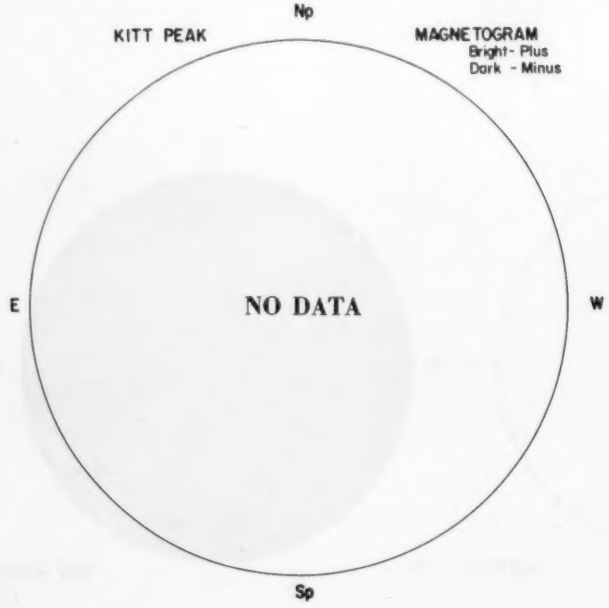
2000 UT

1-8Å FLUX (10^{-8} Wm^{-2})

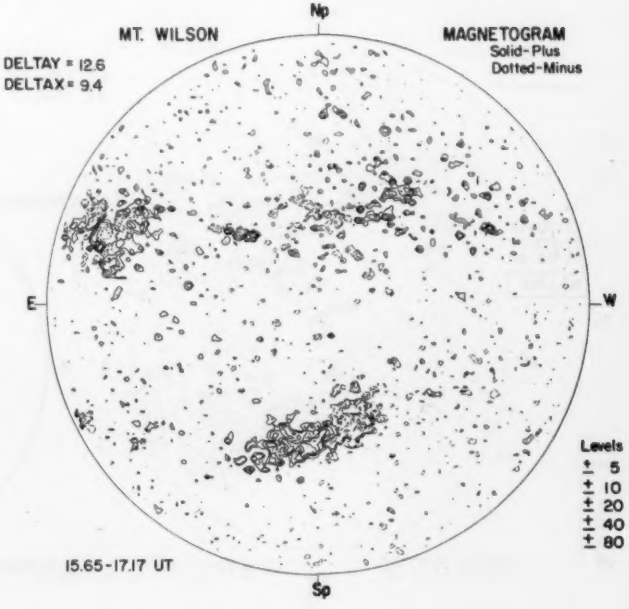
SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

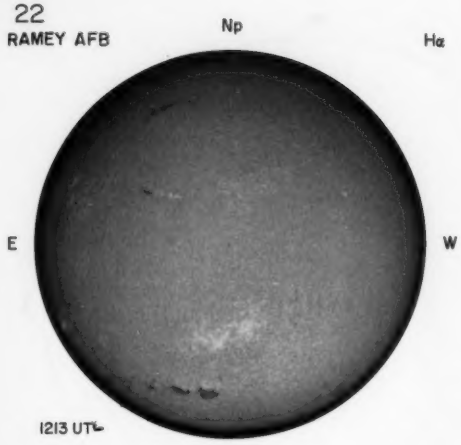


MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.6
DELTAX = 9.4



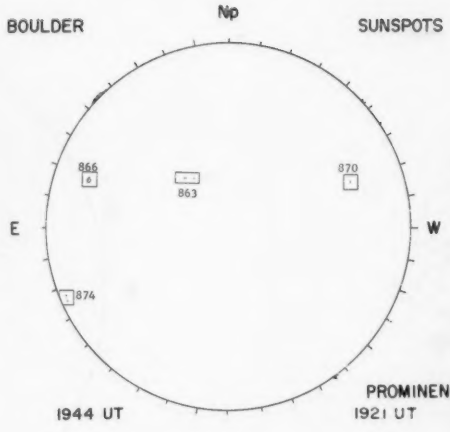
15.65-17.17 UT

RAMEY AFB



1213 UT

Hα BOULDER



1944 UT

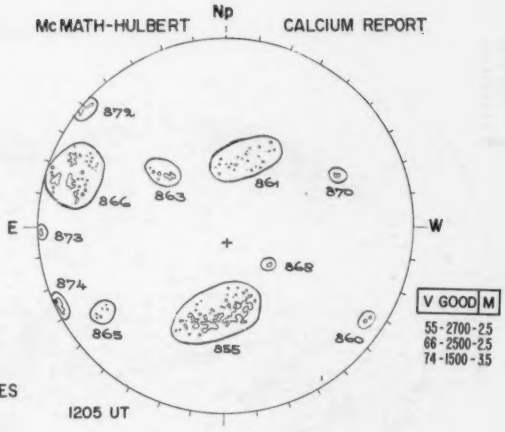
SUNSPOTS

PROMINENCES

1921 UT

McMATH-HULBERT

CALCIUM REPORT

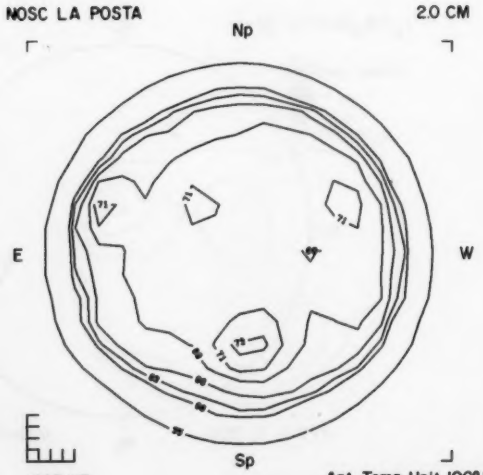


1205 UT

V GOOD	M

55 - 2700 - 2.5
66 - 2500 - 2.5
74 - 1500 - 3.5

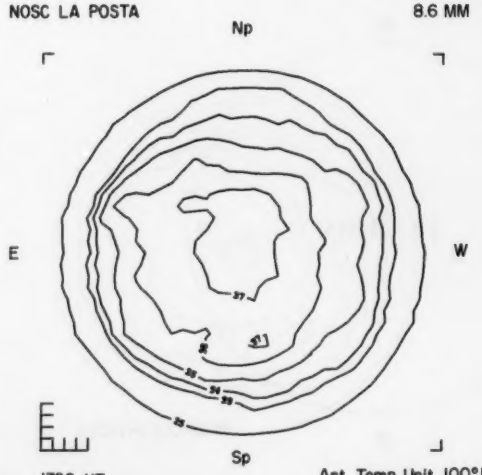
NOSC LA POSTA 2.0 CM



1627 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

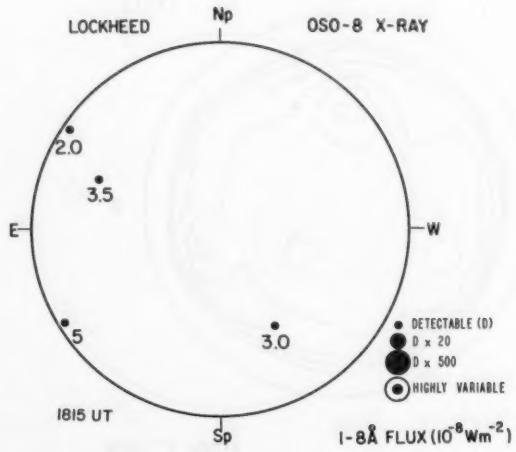


1722 UT

Ant. Temp. Unit 100°K

JULY 23, 1977 (P = 7.07, B_o = 5.08, L_o = 197.97)

LOCKHEED OSO-8 X-RAY

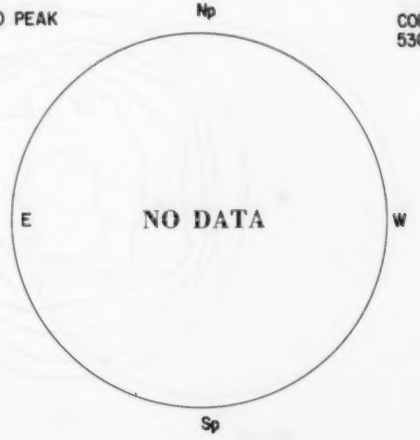


1815 UT

1-8Å FLUX (10^{-8} Wm^{-2})

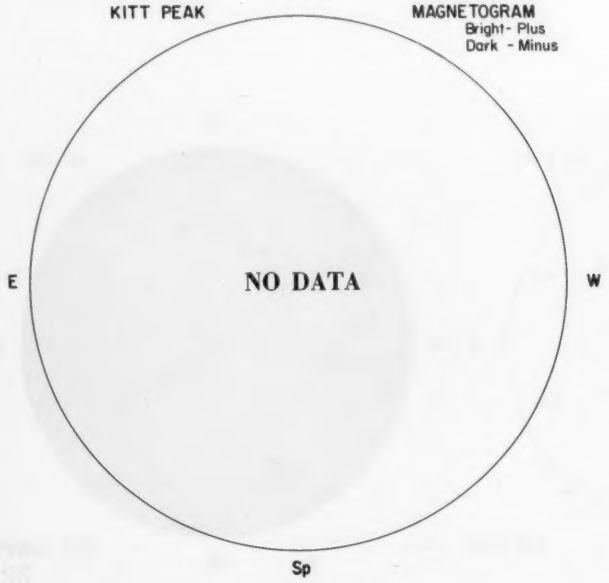
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

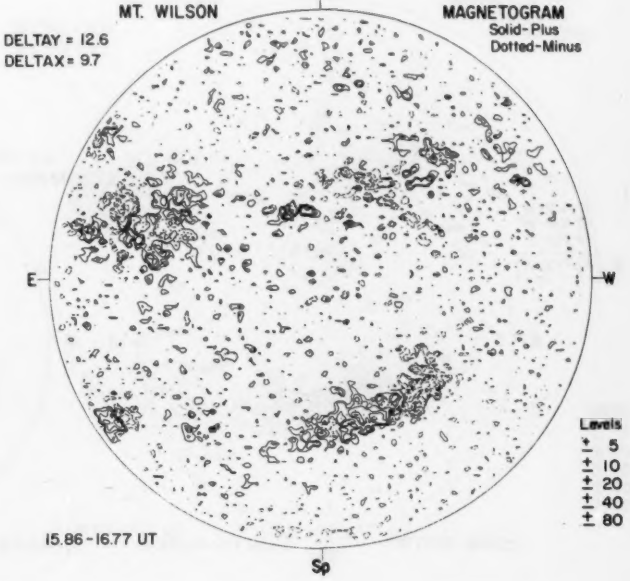
MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON

MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY = 12.6
DELTAX = 9.7



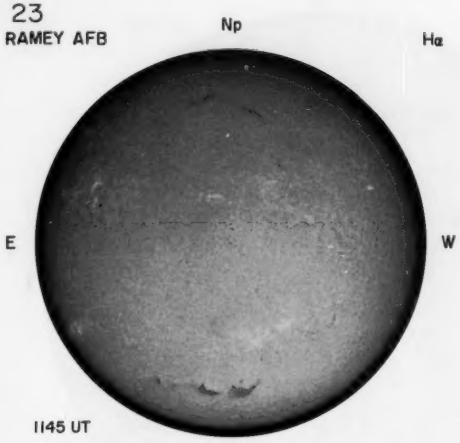
15.86 - 16.77 UT

Sp

Sp

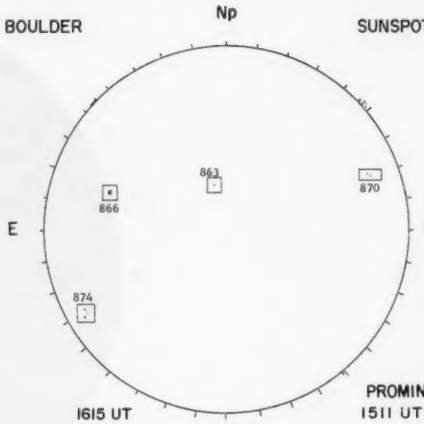
23

RAMEY AFB



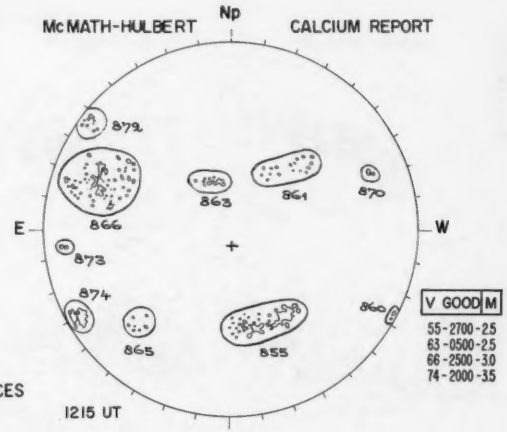
1145 UT

Hα BOULDER



1615 UT

SUNSPOTS



1215 UT

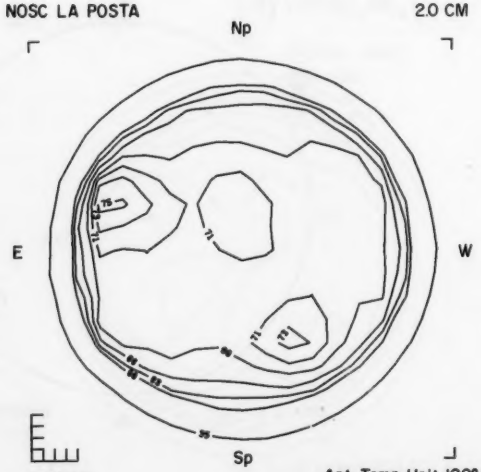
McMATH-HULBERT CALCIUM REPORT

V	GOOD	M
55 - 2700 - 2.5		
63 - 0500 - 2.5		
66 - 2500 - 3.0		
74 - 2000 - 3.5		

PROMINENCES

1511 UT

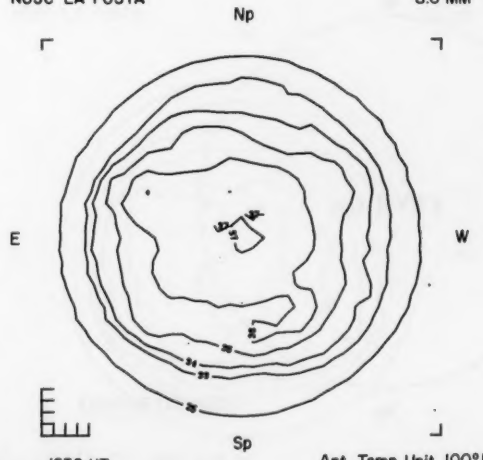
NOSC LA POSTA 2.0 CM



1756 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM



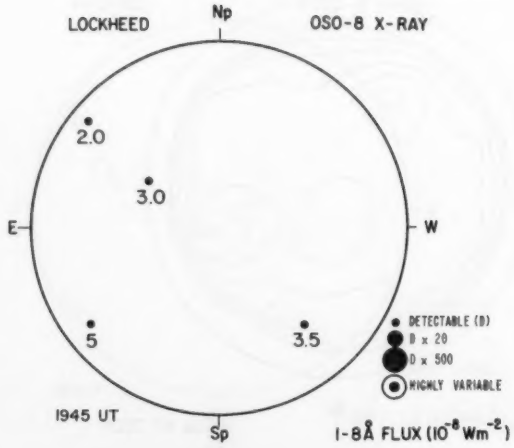
1636 UT

Ant. Temp. Unit 100°K

77 Jul 77

JULY 24, 1977 (P = 7.49, B_0 = 5.17, L_0 = 184.74)

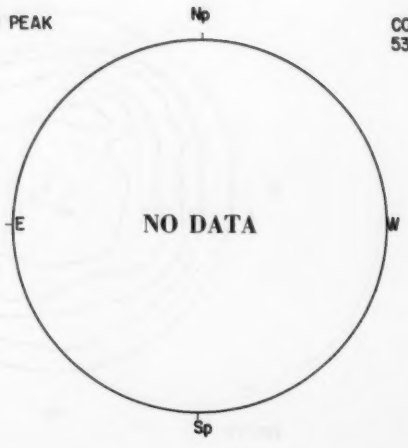
LOCKHEED OSO-8 X-RAY



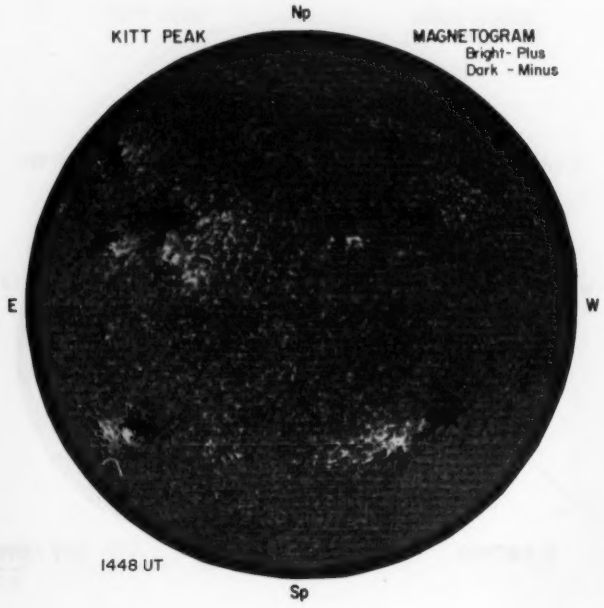
1945 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



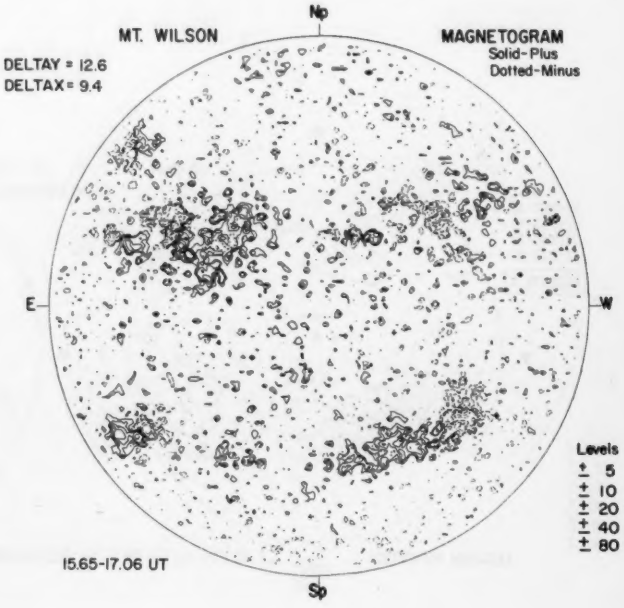
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1448 UT

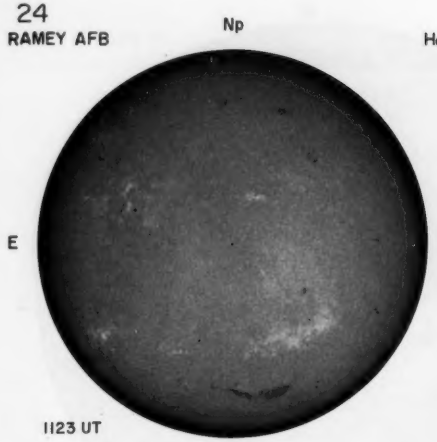
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY = 12.6
DELTAX = 9.4



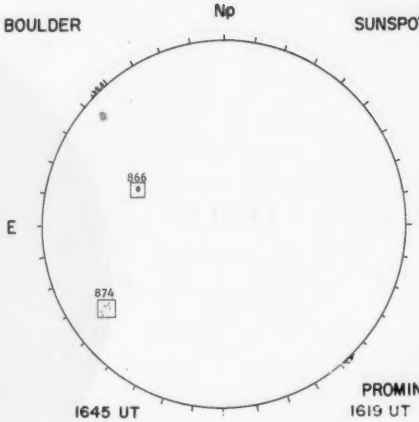
1565-1706 UT

RAMEY AFB



1123 UT

Hα BOULDER



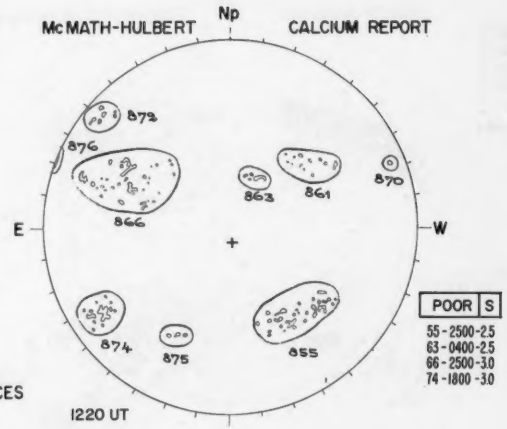
1645 UT

SUNSPOTS

PROMINENCES

1619 UT

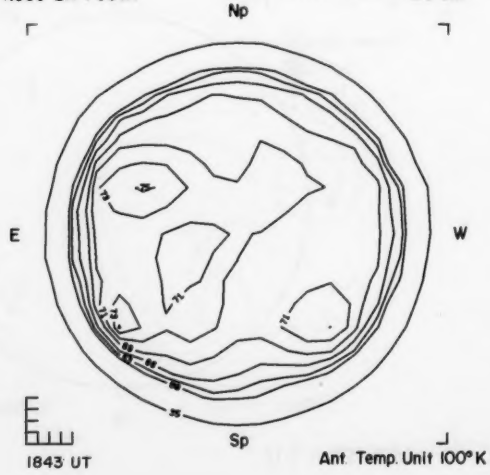
McMATH-HULBERT CALCIUM REPORT



1220 UT

POOR	S
55 - 2500 - 2.5	
63 - 0400 - 2.5	
66 - 2500 - 3.0	
74 - 1800 - 3.0	

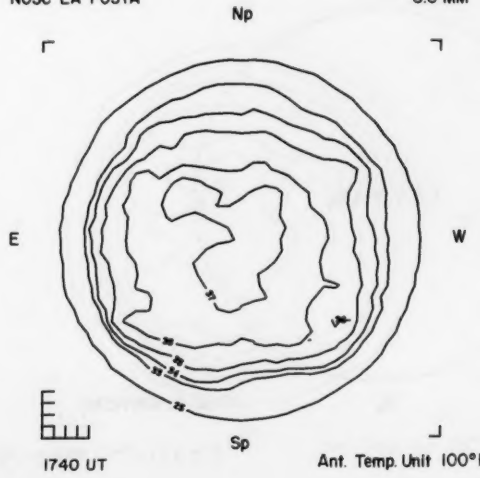
NOSC LA POSTA 2.0 CM



1843 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM



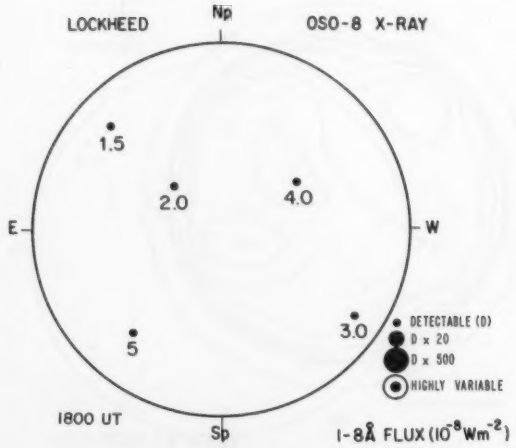
1740 UT

Ant. Temp. Unit 100°K

79 Jul 77

JULY 25, 1977 (P = 7.92, B_o = 5.25, L_o = 171.51)

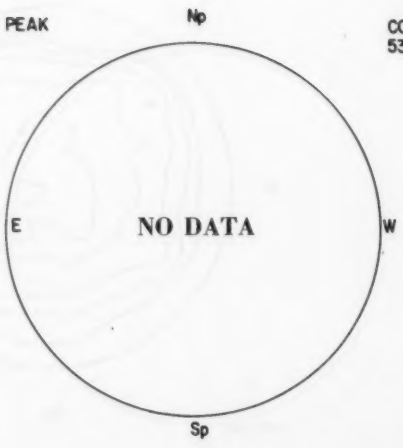
LOCKHEED — OSO-8 X-RAY



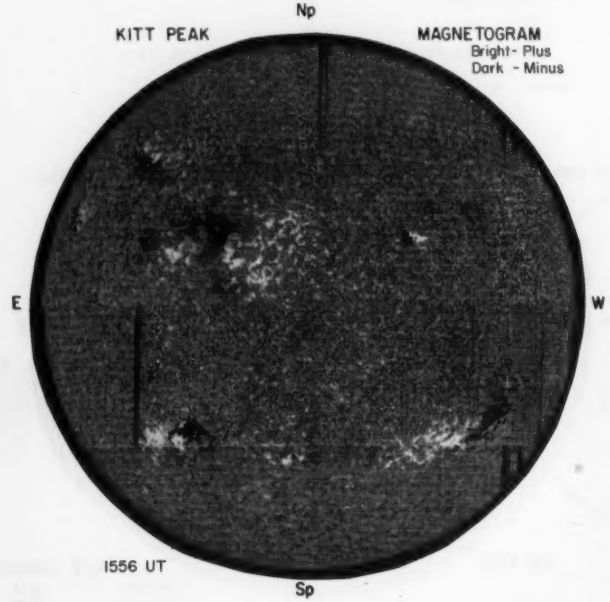
1800 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK — CORONA (1.15 R_o) 5303 Å



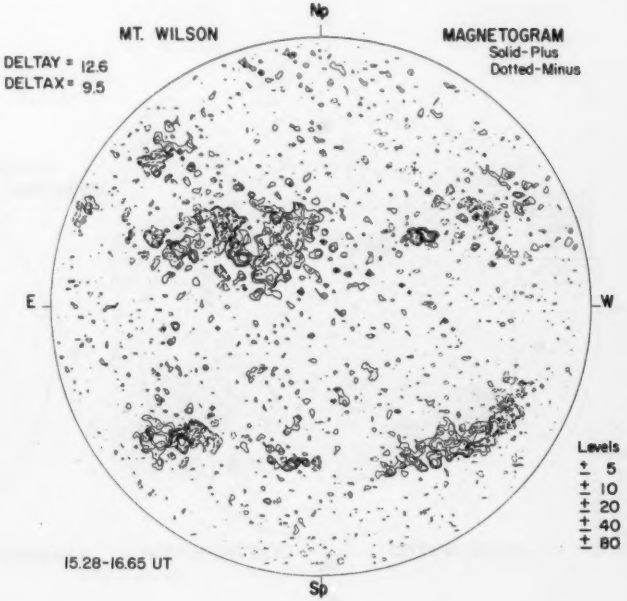
KITT PEAK — MAGNETOGRAM
Bright - Plus
Dark - Minus



1556 UT

MT. WILSON — MAGNETOGRAM
Solid - Plus
Dotted - Minus

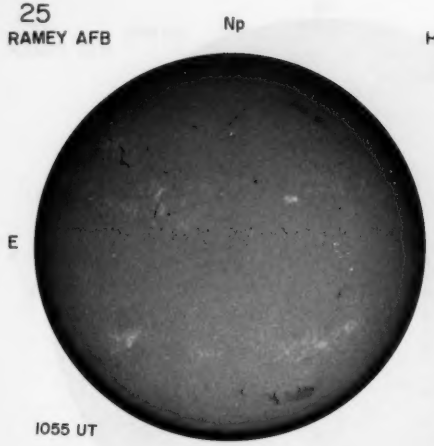
DELTAY = 12.6
DELTAX = 9.5



15.28-16.65 UT

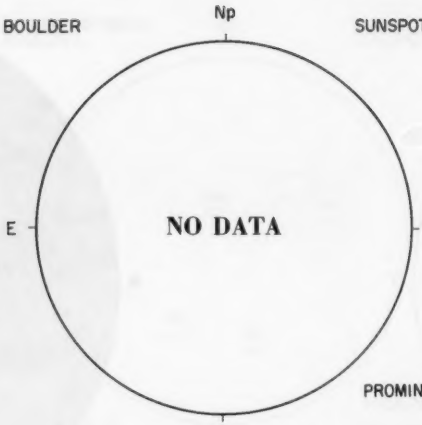
25

RAMEY AFB



1055 UT

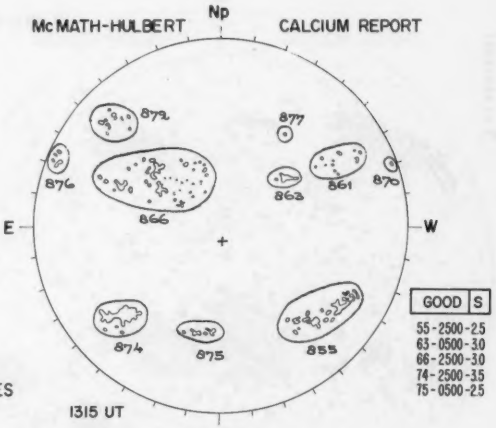
Hα BOULDER



SUNSPOTS

PROMINENCES

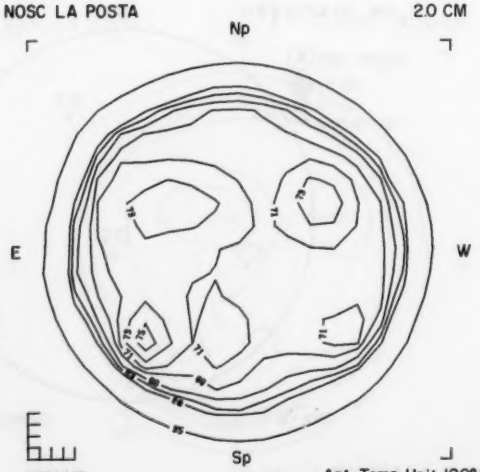
McMATH-HULBERT CALCIUM REPORT



1315 UT

GOOD	S
55 - 2500 - 25	
63 - 0500 - 30	
66 - 2500 - 30	
74 - 2500 - 35	
75 - 0500 - 25	

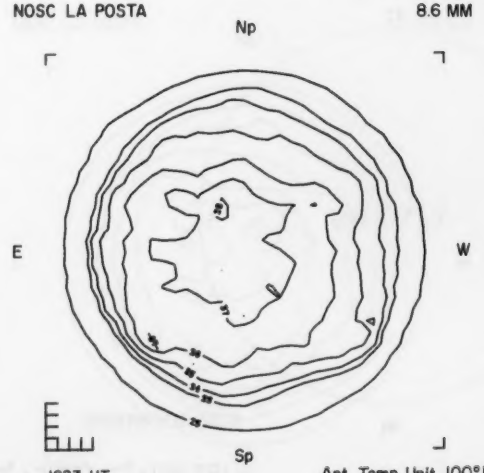
NOSC LA POSTA 2.0 CM



1731 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM



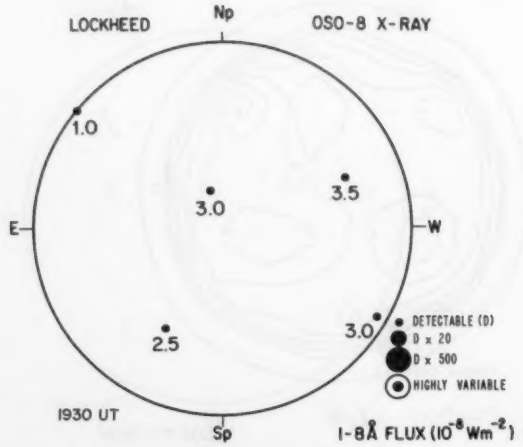
1623 UT

Ant. Temp. Unit 100°K

81
Jul 77

JULY 26, 1977 (P = 8.34, B_o = 5.33, L_o = 158.28)

LOCKHEED — OSO-8 X-RAY

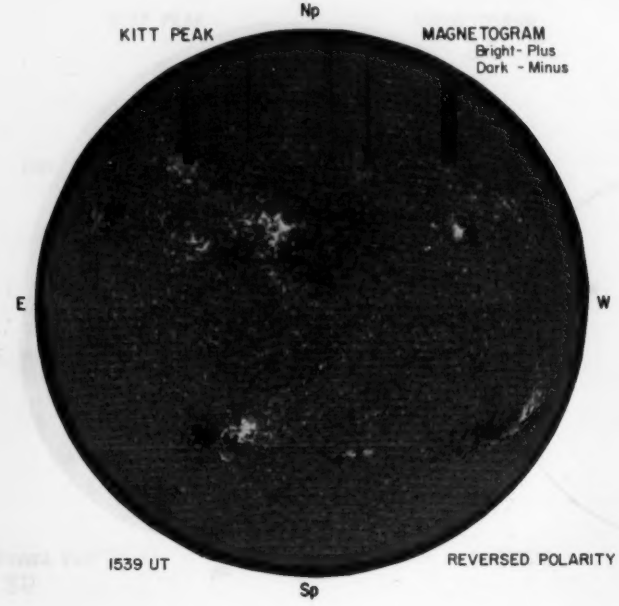


1930 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK — CORONA (1.15 R_o) 5303 Å

KITT PEAK — MAGNETOGRAM
Bright - Plus
Dark - Minus

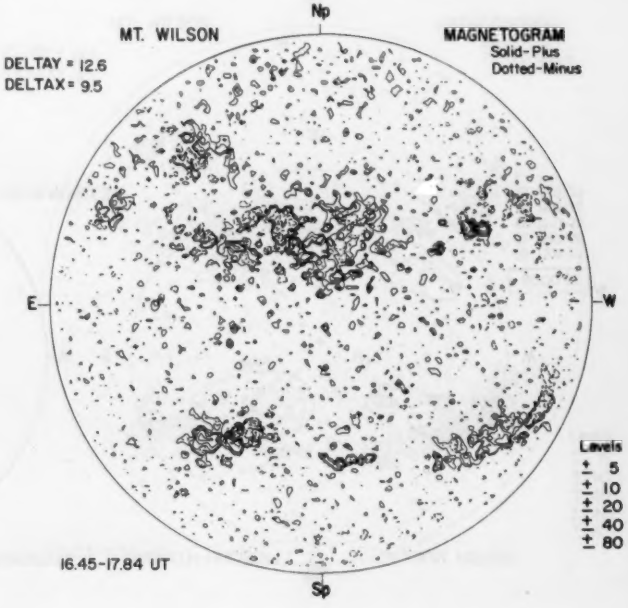


1539 UT

REVERSED POLARITY

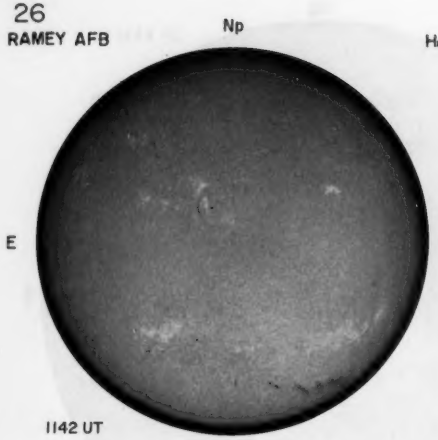
MT. WILSON — MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY = 12.6
DELTAX = 9.5



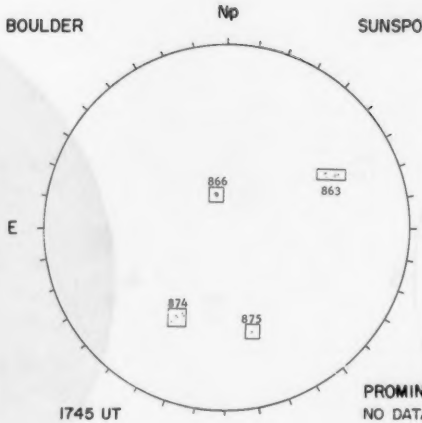
16.45-17.84 UT

RAMEY AFB



Hα 1142 UT

BOULDER

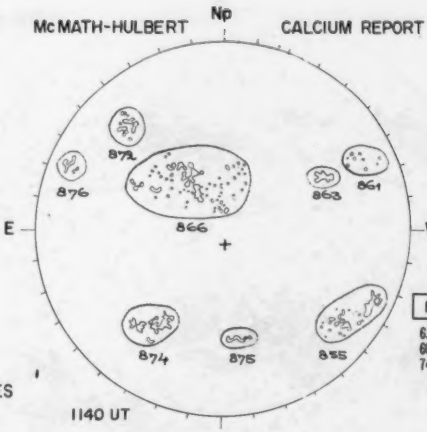


1745 UT

SUNSPOTS

PROMINENCES
NO DATA

McMATH-HULBERT



1140 UT

CALCIUM REPORT

FAIR	S

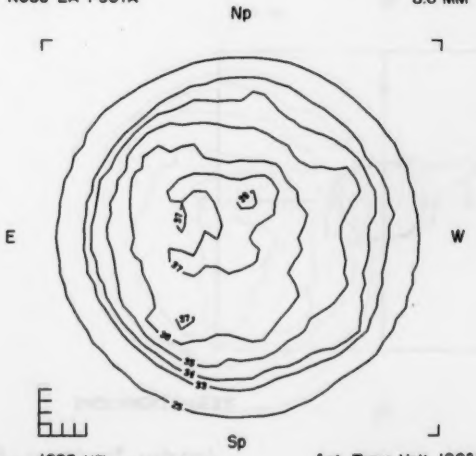
63 - 0600 - 3.0
66 - 2400 - 2.5
74 - 2000 - 3.0

NOSC LA POSTA 2.0 CM

1727 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

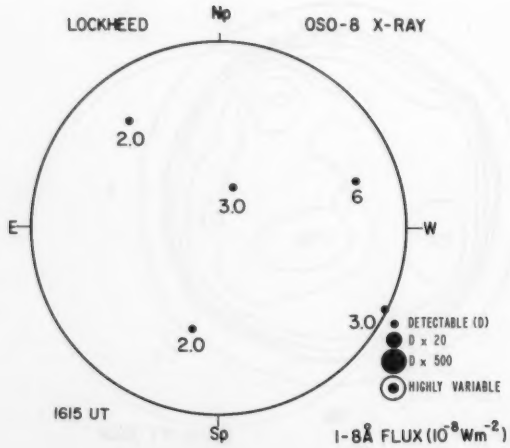


1623 UT

Ant. Temp. Unit 100°K

JULY 27, 1977 (P = 8.75, B_0 = 5.42, L_0 = 145.05)

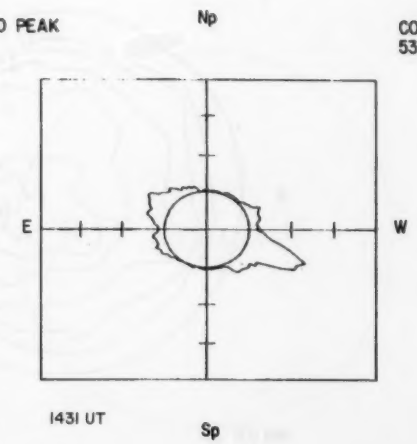
LOCKHEED OSO-8 X-RAY



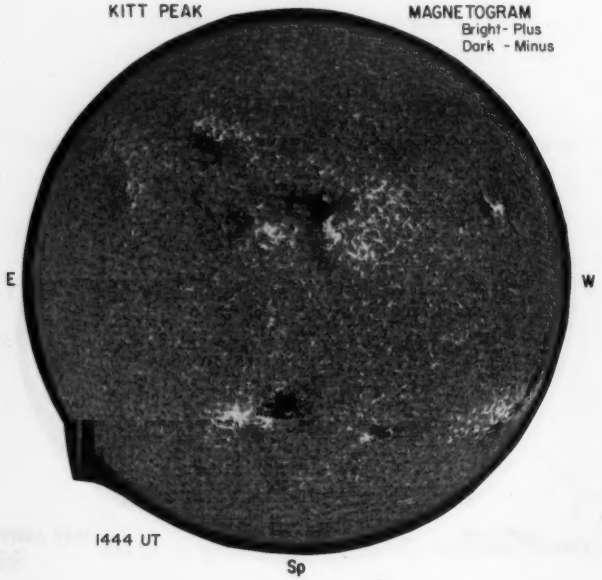
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

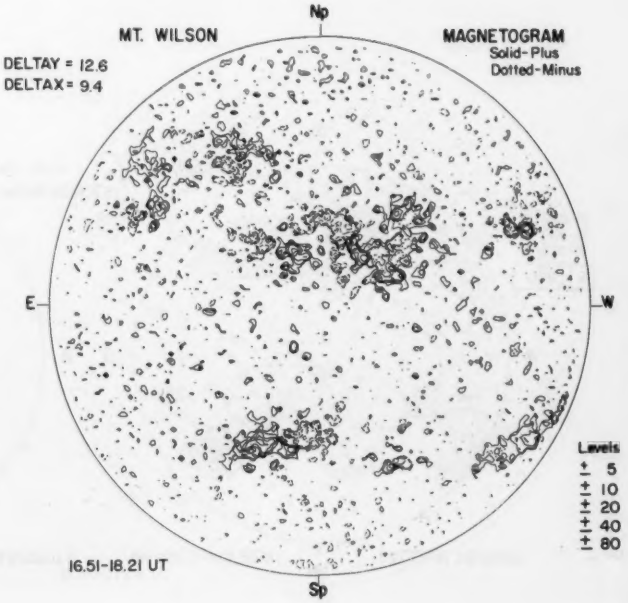
CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

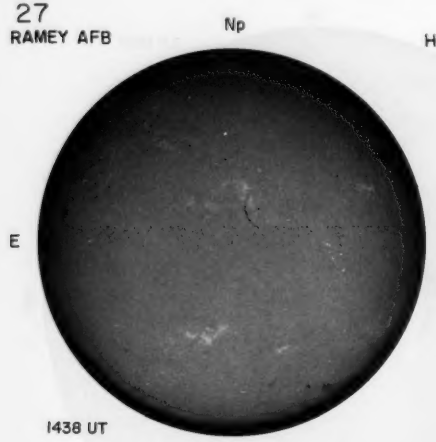


MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.6
DELTAX = 9.4



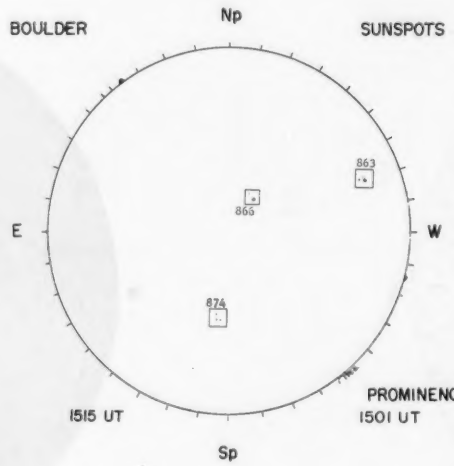
27

RAMEY AFB



1438 UT

Hα BOULDER



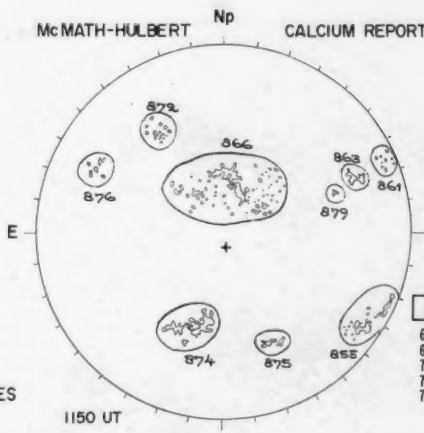
1515 UT

SUNSPOTS

PROMINENCES

1501 UT

McMATH-HULBERT



1150 UT

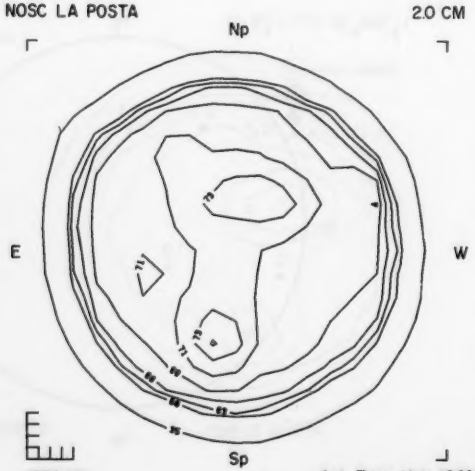
CALCIUM REPORT

GOOD	S

63-0800-30
66-2800-25
74-2200-30
75-0400-25
79-0200-25

NOSC LA POSTA

2.0 CM

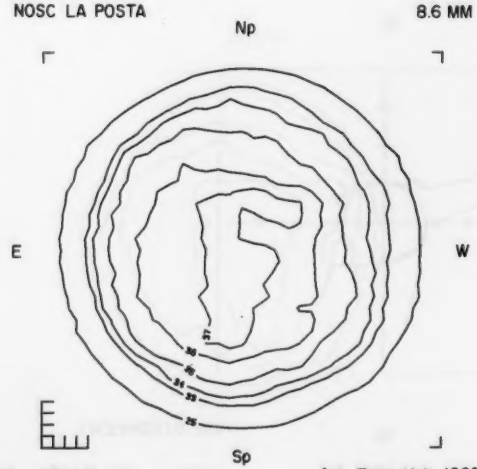


1830 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

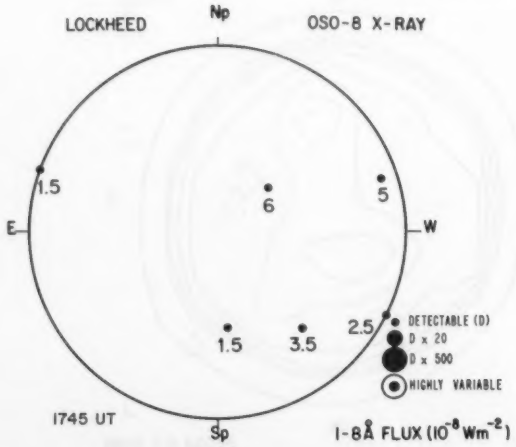


1730 UT

Ant. Temp. Unit 100°K

JULY 28, 1977 (P = 9.17, B_o = 5.50, L_o = 131.82)

LOCKHEED OSO-8 X-RAY

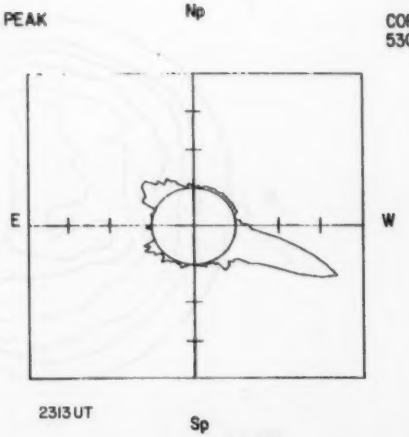


1745 UT

1-8Å FLUX (10^{-8} Wm^{-2})

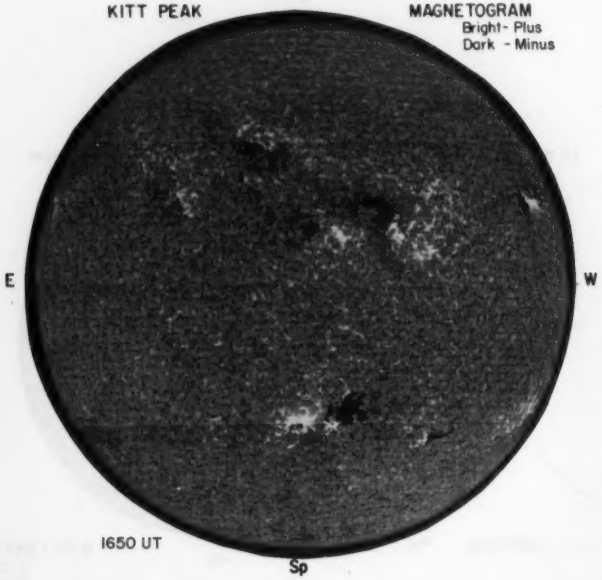
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



2313 UT

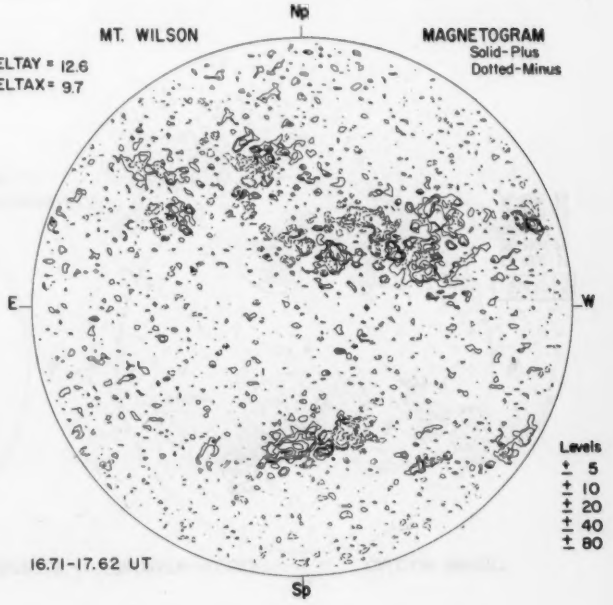
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1650 UT

MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

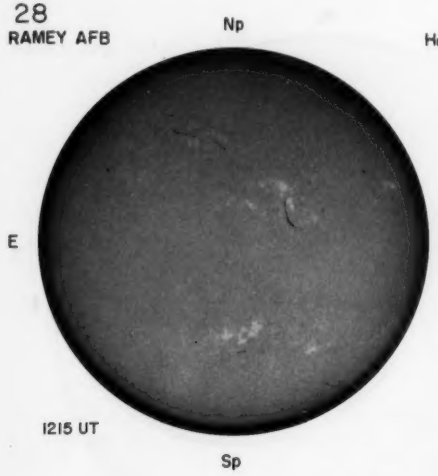
DELTAY = 12.6
DELTAX = 9.7



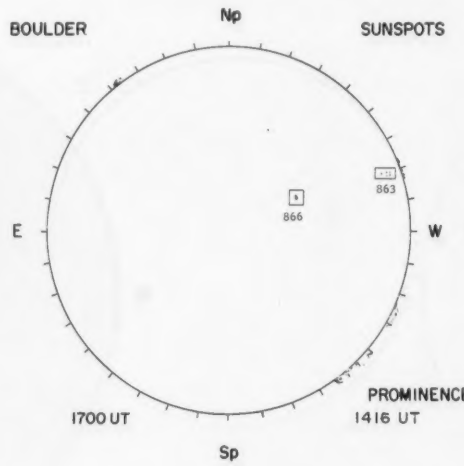
16.71-17.62 UT

28

RAMEY AFB



Hα BOULDER



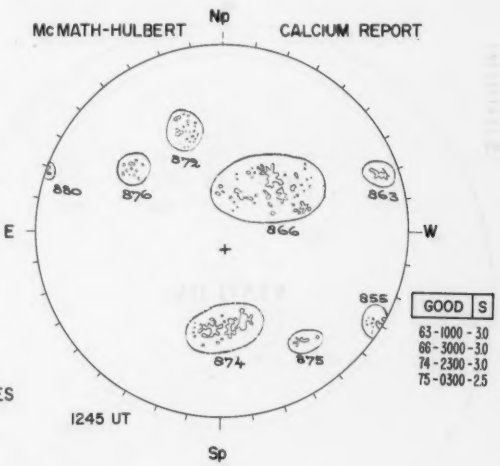
SUNSPOTS

PROMINENCES

1416 UT

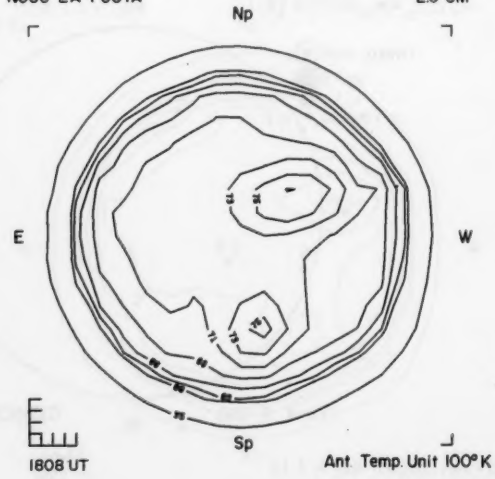
McMATH-HULBERT

CALCIUM REPORT

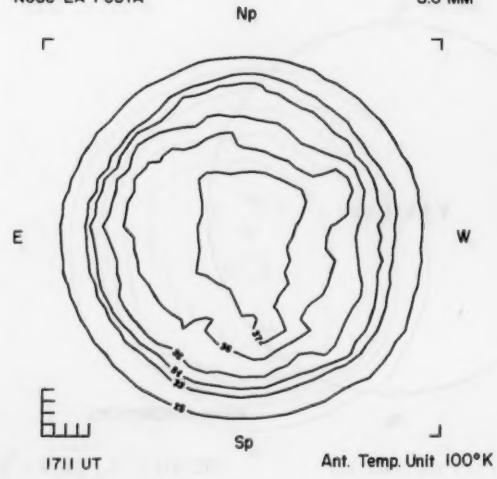


GOOD	S
63 - 1000	3.0
66 - 3000	3.0
74 - 2300	3.0
75 - 0300	2.5

NOSC LA POSTA 2.0 CM



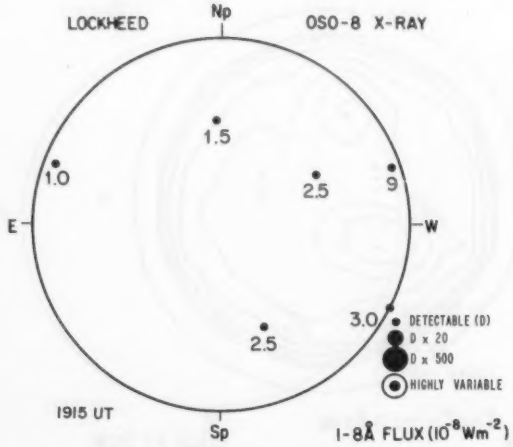
NOSC LA POSTA 8.6 MM



87
Jul 77

JULY 29, 1977 (P = 9.58, B_o = 5.57, L_o = 118.60)

LOCKHEED OSO-8 X-RAY

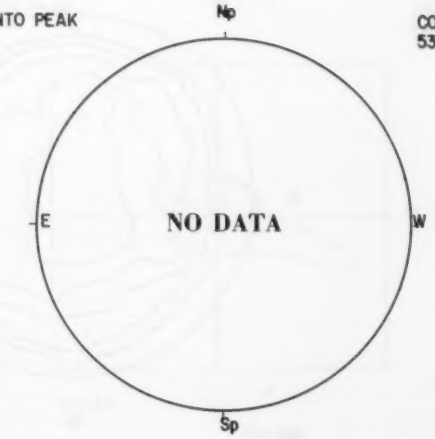


1915 UT

1-8Å FLUX (10^{-8} Wm^{-2})

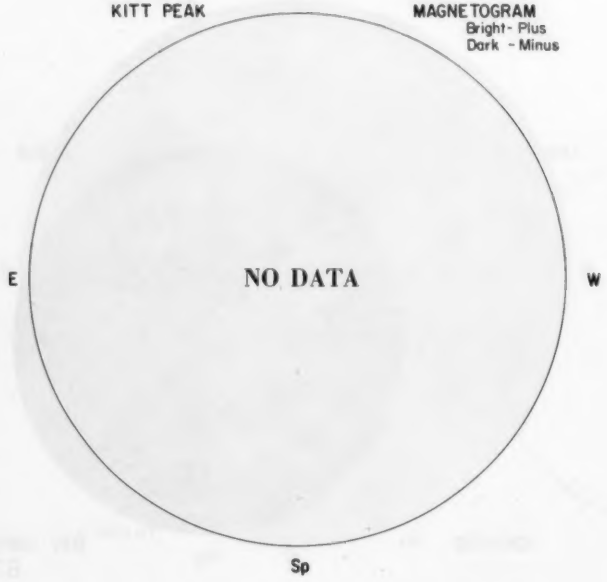
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

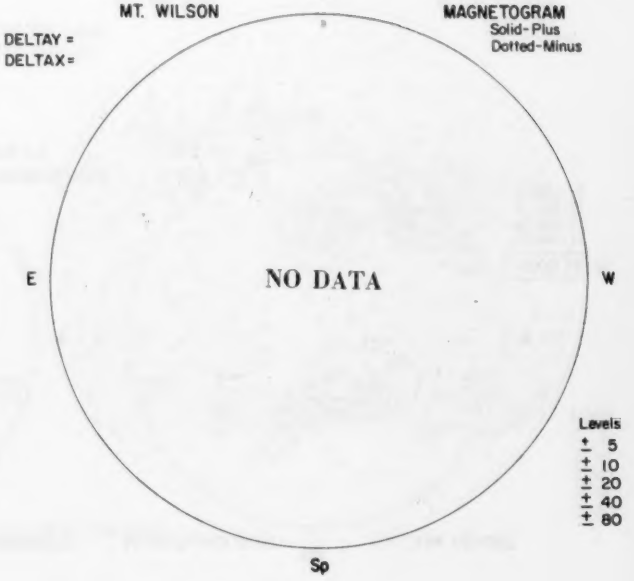
MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON

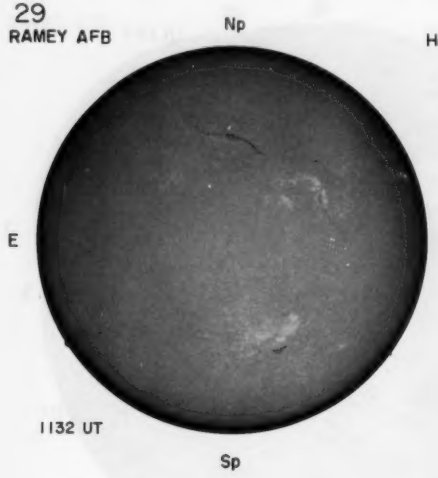
DELTAY =
DELTAX =

MAGNETOGRAM
Solid - Plus
Dotted - Minus



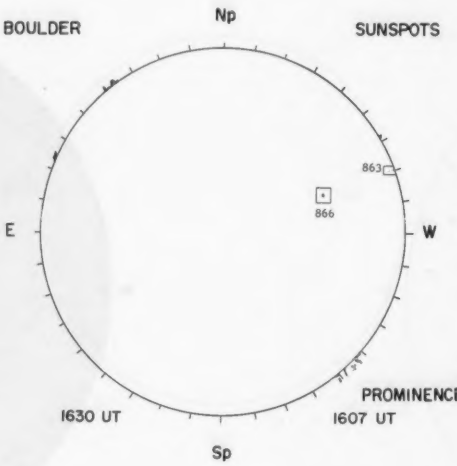
29

RAMEY AFB



1132 UT

Hα BOULDER

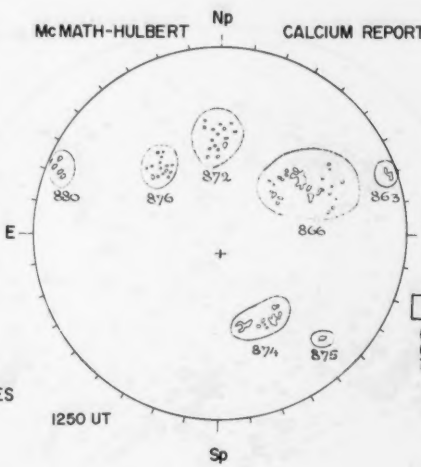


1630 UT

SUNSPOTS

1607 UT

McMATH-HULBERT



1250 UT

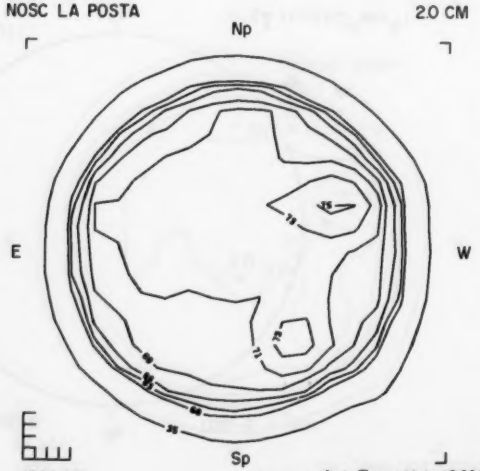
CALCIUM REPORT

POOR | D

63-0800-25
66-2500-25
74-1800-25

PROMINENCES

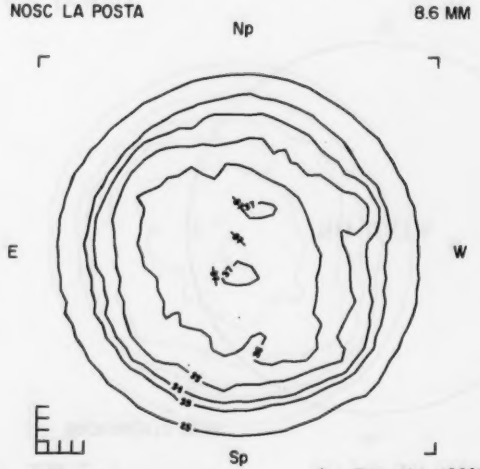
NOSC LA POSTA 2.0 CM



1822 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

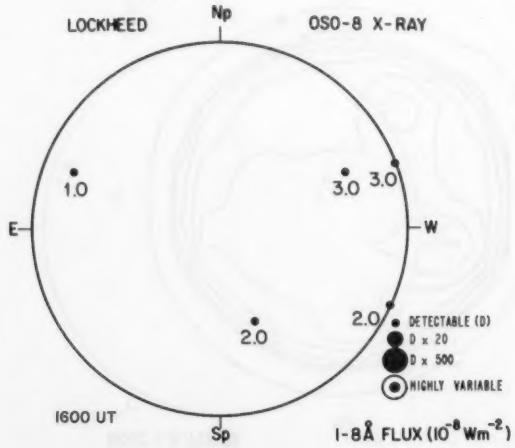


1704 UT

Ant. Temp. Unit 100°K

JULY 30, 1977 (P = 9.98, B_0 = 5.65, L_0 = 105.37)

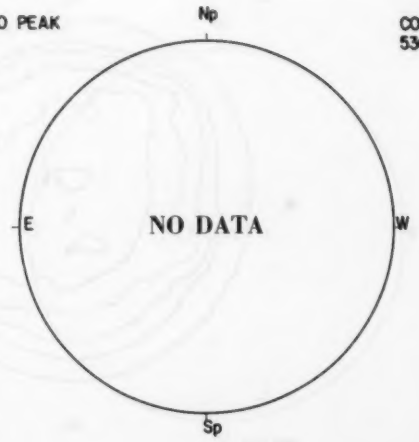
LOCKHEED OSO-8 X-RAY



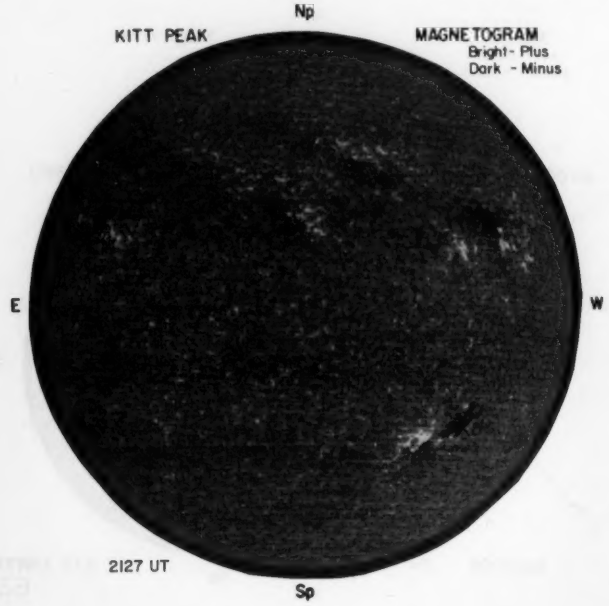
1600 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



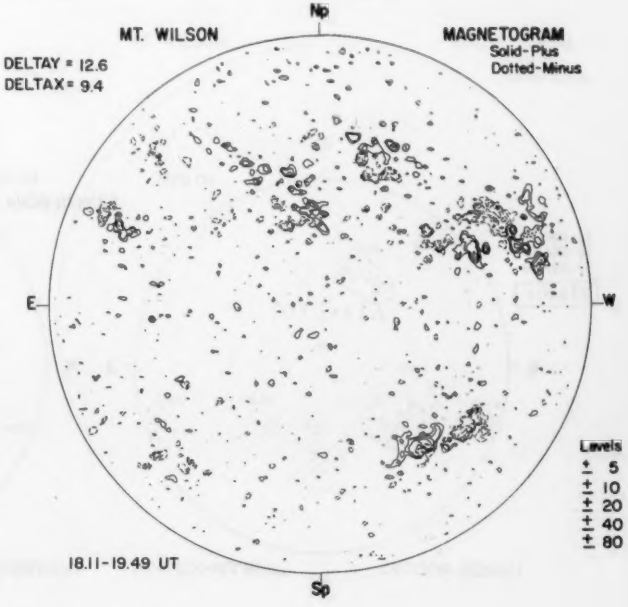
KITT PEAK MAGNETOGRAM Bright - Plus Dark - Minus



2127 UT

MT. WILSON MAGNETOGRAM Solid - Plus Dotted - Minus

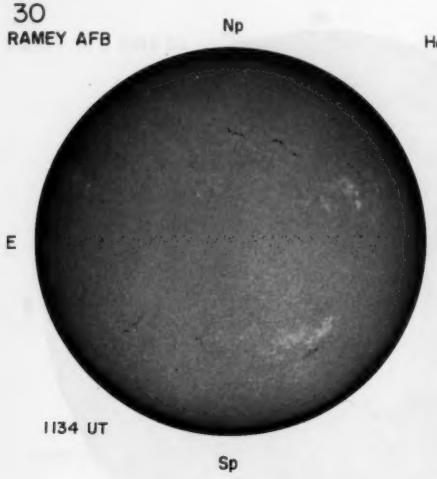
DELTAY = 12.6
DELTAX = 9.4



18.11-19.49 UT

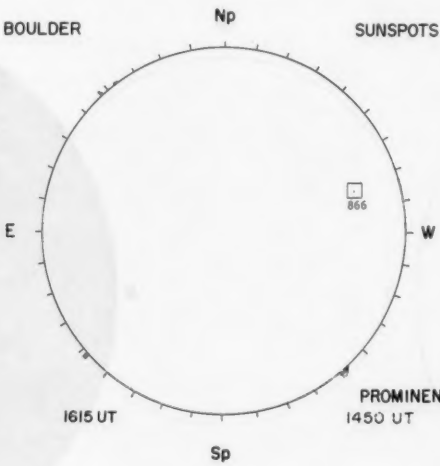
30

RAMEY AFB



1134 UT

Hα BOULDER



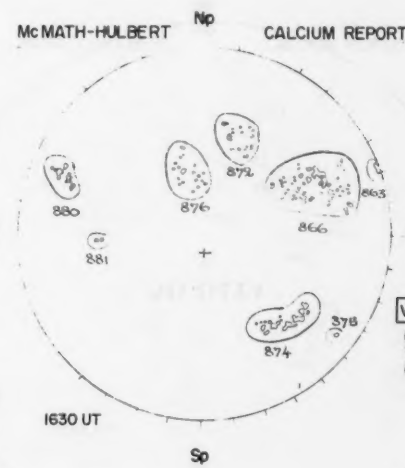
1615 UT

SUNSPOTS

PROMINENCES

1450 UT

McMATH-HULBERT

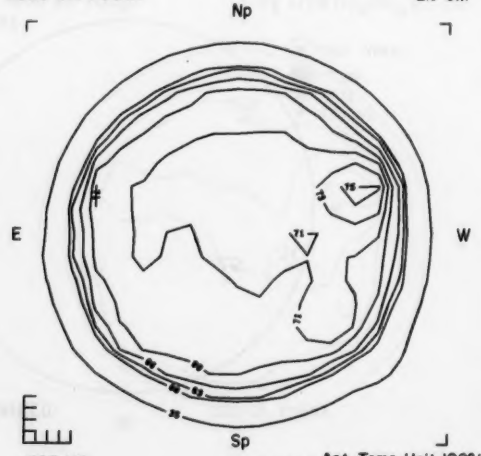


1630 UT

CALCIUM REPORT

V GOOD	M
66 - 2500 - 3.0	
74 - 1800 - 3.0	
80 - 0900 - 2.5	

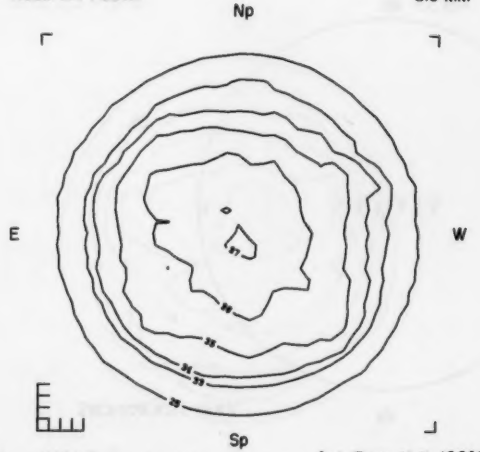
NOSC LA POSTA 2.0 CM



1822 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

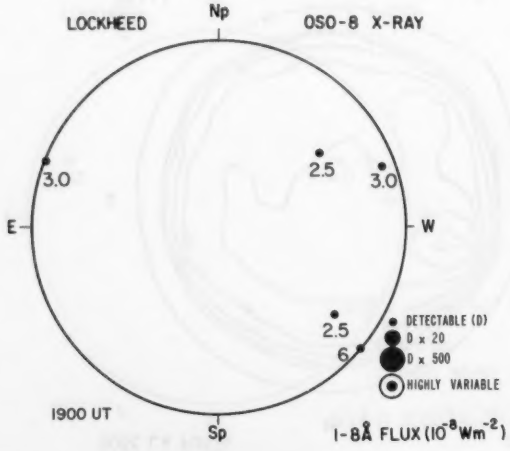


1639 UT

Ant. Temp. Unit 100°K

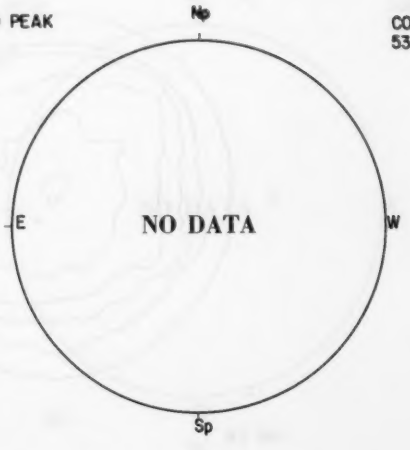
JULY 31, 1977 (P = 10.39, B_0 = 5.73, L_0 = 92.14)

LOCKHEED — OSO-8 X-RAY

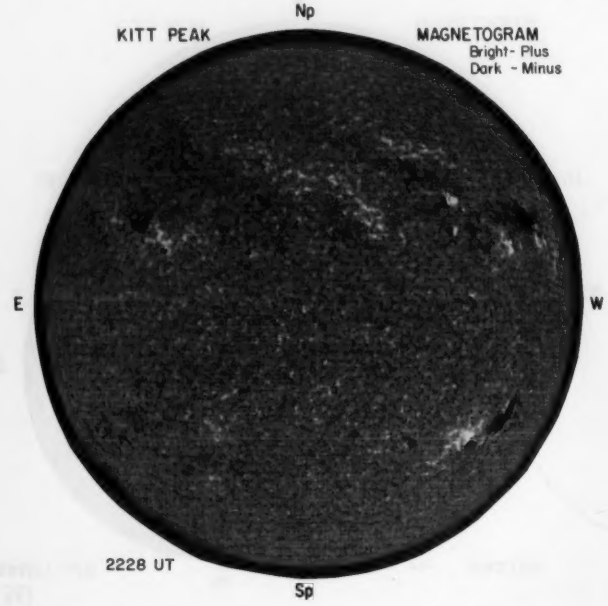


1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK — CORONA (1.15 $R_\odot$) 5303 Å

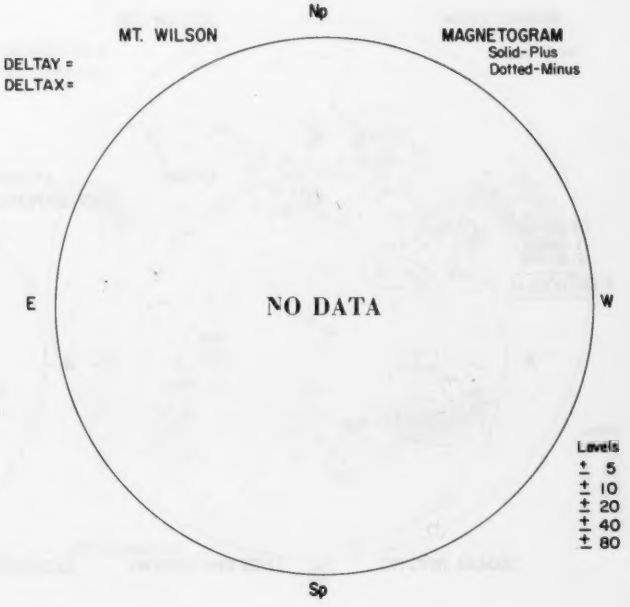


KITT PEAK — MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON — MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

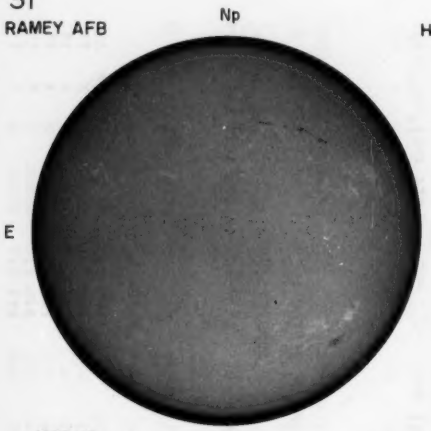


Sp

Sp

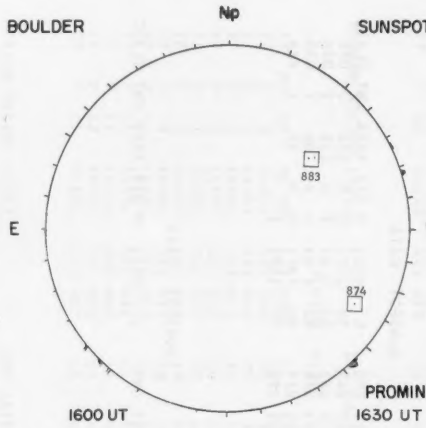
31

RAMEY AFB



1220 UT

Hα BOULDER



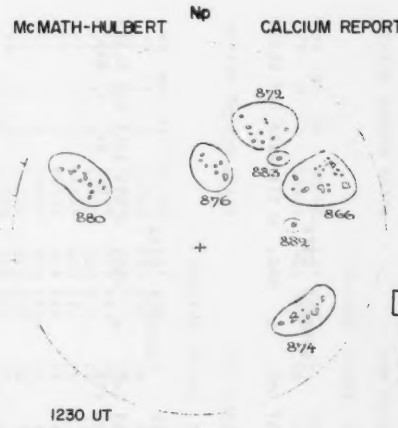
1600 UT

SUNSPOTS

PROMINENCES

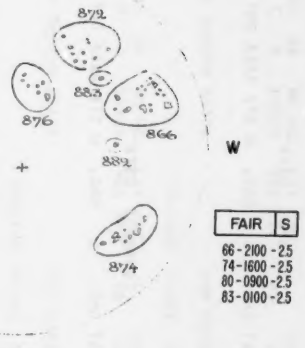
1630 UT

McMATH-HULBERT



1230 UT

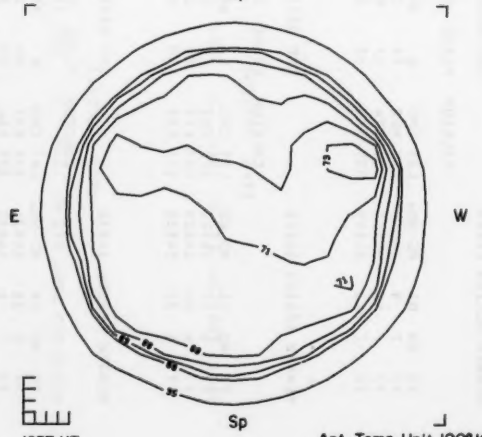
CALCIUM REPORT



FAIR	S

66-2100-25
74-1600-25
80-0900-25
83-0100-25

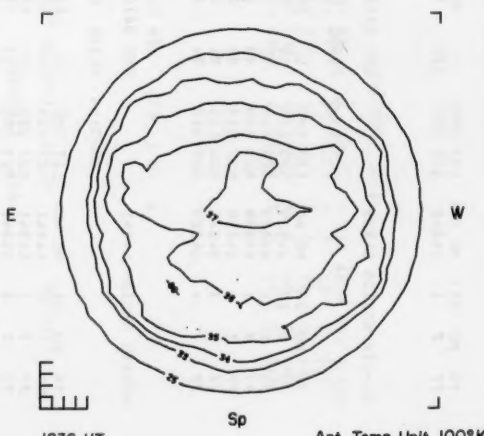
NOSC LA POSTA 2.0 CM



1937 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM



1836 UT

Ant. Temp. Unit 100°K

REGIONS OF SOLAR ACTIVITY

JULY 1977

MCMATH REGION 14834 CMP DATE 1.2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	2	14834	S25 W18	126	100	1.5									

MCMATH REGION 14842 CMP DATE 1.2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	6	14842	S20 W70	126	300	1.5									

MCMATH REGION 14829 CMP DATE 3.6

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	6	29	14829	N23 E55	95	200	2.0		N21 E50				H	20	2	BXO
77	6	30	14829	N23 E42	95	600	2.5									
77	7	1	14829	N23 E29	93	300	1.5									
77	7	2	14829	N23 E15	93	100	1.0									
77	7	3	14829	N23 E01	94	200	1.5									
77	7	4	14829	N23 W13	94	200	1.0									

MCMATH REGION 14841 CMP DATE 3.6

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	6	14841	N23 W38	94	1000	4.0	19810	N22 W40	94	(BP)	5	B	120	9	DAI
77	7	7	14841	N23 W52	94	1000	3.5	19810	N22 W53	93	(B)	5	B	200	3	DSO
77	7	8	14841	N23 W66	93	1500	3.0	19810	N22 W65	92	(B)	4	B	90	7	CSO
77	7	9	14841	N24 W78	94	1500	3.0	19810	N21 W78	92	(BF)	4	B	20	1	AXX
77	7	10	14841					19810	N22 W76	77	(AP)	1				

MCMATH REGION 14849 CMP DATE 4.8

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	9	14849	N25 W62	78	200	2.0									
77	7	10	14849	N25 W74	77	500	2.5									
77	7	11	14849	N25 W89	80	300	1.5									

MCMATH REGION 14828 CMP DATE 4.9

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	6	28	14828	S21 E85	77	300	2.0									
77	6	29	14828	S20 E70	80	200	1.5									
77	6	30	14828	S20 E58	79	200	2.0									

MCMATH REGION 14831 CMP DATE 6.3 RETURN OF REGION 14796 ROTATION 3

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	6	30	14831	S26 E77	60	700	1.5									
77	7	1	14831	S26 E64	58	500	2.0									
77	7	2	14831	S26 E51	57	400	2.0									
77	7	3	14831	S26 E37	58	600	2.0									
77	7	4	14831	S27 E23	58	800	2.0									
77	7	5	14831	S27 E10	59	800	1.5									
77	7	6	14831	S27 W02	58	700	1.5									
77	7	7	14831	S27 W16	58	500	2.0									
77	7	8	14831	S27 W30	57	500	2.0									
77	7	9	14831	S27 W42	58	500	2.0									
77	7	10	14831	S27 W54	57	500	2.0									
77	7	11	14831	S27 W68	59	300	2.0									

JULY 1977

MCMATH REGION 14839 CMP DATE 7.9

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	5	14839	S20 E31	38	100	1.5									

MCMATH REGION 14836 CMP DATE 8.8

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	4	14836	N08 E55	26	100	1.5									

MCMATH REGION 14835 CMP DATE 8.9

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	2	14835	N17 E82	26	600	2.0	19808	N17 E77	29	(AP)	3	B	10	1	AXX
77	7	3	14835	N19 E72	23	1200	2.5	19808	N18 E63	30	(AP)	3	B	10	1	AXX
77	7	4	14835	N19 E55	26	1200	3.0	19808	N18 E49	31	(AP)	4	B	10	1	AXX
77	7	5	14835	N19 E44	25	1100	3.0	19808	N18 E36	31	(AP)	3	R	10	1	AXX
77	7	6	14835	N19 E31	25	1200	2.0									
77	7	7	14835	N19 E17	25	800	2.0									
77	7	8	14835	N19 E04	23	700	2.0									
77	7	9	14835	N19 W08	24	700	2.0									
77	7	10	14835	N19 W20	23	800	2.0									
77	7	11	14835	N19 W35	26	800	2.5									
77	7	12	14835	N20 W51	24	700	3.0	19811	N23 W54	29	(B)	4				
77	7	13	14835	N20 W62	26	600	3.0									
77	7	14	14835	N20 W75	26	600	1.0									

MCMATH REGION 14851 CMP DATE 9.2 RETURN OF REGION 14805 ROTATION 4

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	3	14851	S22 E66	29	500	1.0									
77	7	4	14851	S23 E54	27	500	1.0									
77	7	5	14851	S23 E43	26	600	1.0									
77	7	6	14851	S23 E32	24	500	1.0									
77	7	7	14851	S23 E22	20	600	1.0									
77	7	8	14851	S23 E08	19	600	1.0									
77	7	9	14851	S23 W03	19	600	1.0									
77	7	10	14851	S24 W17	20	500	1.0									
77	7	11	14851	S24 W30	21	500	1.5									
77	7	12	14851	S24 W46	19	400	1.0									
77	7	13	14851	S24 W55	19	400	1.0									
77	7	14	14851	S25 W67	18	400	1.0									

MCMATH REGION 14837 CMP DATE 9.7

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	4	14837	S37 E67	14	200	1.0									

MCMATH REGION 14848 CMP DATE 10.0

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	8	14848	N22 E18	9	200	1.5									

MCMATH REGION 14838 CMP DATE 10.8 RETURN OF REGION 14801 ROTATION 4

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	4	14838	S20 E88	354	500	1.5	19809	S20 E80	0	(AP)	3	B	200	3	CSO
77	7	5	14838	S19 E70	0	400	2.5	19809	S20 E67	0	(AP)	5	R	60	1	HSX
77	7	6	14838	S19 E60	357	400	1.5	19809	S20 E54	0	(AP)	5				
77	7	7	14838	S19 E46	357	400	1.5	19809	S20 E41	0	(AP)	4	B	60	1	HSX
77	7	8	14838	S19 E30	358	500	1.5	19809	S19 E28	0	(AP)	4	B	50	1	HSX

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MCMATH REGION 14838 (CONT) CMP DATE 10.8 RETURN OF REGION 14801 ROTATION 4

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
77	7	9	14838	S19 E17	0	500	1.5	19809	S19 E16	359	(Y)	4 B	40	1	HSX
77	7	10	14838	S19 E04	0	600	1.5	19809	S20 E02	0	(AP)	4 B	40	3	CSO
77	7	11	14838	S19 W09	0	600	2.0	19809	S20 W11	0	(AP)	4 B	40	3	HSX
77	7	12	14838	S21 W25	358	500	2.5	19809	S20 W24	359	(BY)	4 B	30	3	CRO
77	7	13	14838	S21 W35	359	700	3.5	19809	S22 W36	358	(Y)	4 B	10	6	BXO
77	7	14	14838	S21 W47	358	800	3.0								
77	7	15	14838	S22 W60	358	600	2.0								
77	7	16	14838	S22 W75	358	400	1.0								

MCMATH REGION 14852 CMP DATE 11.0

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
77	7	11	14852	N43 W07	358	200	2.0								

MCMATH REGION 14843 CMP DATE 11.4 RETURN OF REGION 14801 ROTATION 4

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
77	7	6	14843	S27 E67	350	500	1.0								
77	7	7	14843	S27 E54	349	500	1.0								
77	7	8	14843	S27 E38	350	600	1.5								
77	7	9	14843	S27 E25	352	600	1.5								
77	7	10	14843	S27 E12	352	900	2.0								
77	7	11	14843	S27 W01	352	700	2.0								
77	7	12	14843	S27 W17	350	400	2.0								
77	7	13	14843	S28 W26	350	400	2.0								
77	7	14	14843	S28 W39	350	500	1.5								
77	7	15	14843	S29 W52	350	400	1.0								
77	7	16	14843	S30 W68	351	400	1.0								

MCMATH REGION 14840 CMP DATE 12.1

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
77	7	5	14840	N28 E90	340	200	1.0								
77	7	6	14840	N28 E79	338	500	2.0								
77	7	7	14840	N28 E64	339	400	1.5								
77	7	8	14840	N28 E48	340	300	2.0								
77	7	9	14840	N28 E35	342	300	2.0								
77	7	10	14840	N28 E23	341	400	1.5								
77	7	11	14840	N28 E08	343	300	1.0								
77	7	12	14840	N28 W08	341	100	1.0								

MCMATH REGION 14854 CMP DATE 12.4

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
77	7	15	14854	N18 W41	339	100	1.5								

MCMATH REGION 14845 CMP DATE 13.5

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
77	7	8	14845	N25 E64	324	100	1.5								

MCMATH REGION 14846 CMP DATE 13.9

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS
77	7	8	14846	N20 E70	318	100	1.5								
77	7	9	14846	N20 E58	319	200	2.0								
77	7	10	14846	N18 E45	319	300	1.5								
77	7	11	14846	N19 E32	319	300	1.0								

MCMATH REGION 14857 CMP DATE 13.9

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	17	14857	N13 W48	319	200	2.0									

MCMATH REGION 14850 CMP DATE 15.4

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	10	14850	S23 E68	296	200	1.5									
77	7	11	14850	S22 E52	299	300	1.0									

MCMATH REGION 14862 CMP DATE 16.3

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	19	14862	N46 W44	288	100	1.0									

MCMATH REGION 14860 CMP DATE 17.8

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	18	14860	S25 W09	267	300	2.5									
77	7	19	14860	S25 W23	267	200	2.0	19812	S27 W24	267	(AF)	3	B	10	2	AXX
77	7	20	14860	S26 W35	267	200	1.5									
77	7	21	14860	S26 W48	264	200	1.0									
77	7	22	14860	S26 W61	266	100	1.0									
77	7	23	14860	S26 W76	268	100	1.0									

MCMATH REGION 14870 CMP DATE 19.5

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	22	14870	N20 W39	244	100	2.0									
77	7	23	14870	N20 W53	245	200	2.0	19818	N21 W53	244	(B)	2	B	10	6	BXO
77	7	24	14870	N22 W67	246	200	2.0									
77	7	25	14870	N22 W80	245	200	1.0									

MCMATH REGION 14867 CMP DATE 19.7

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	21	14867	S58 W26	242	200	1.0									

MCMATH REGION 14868 CMP DATE 21.6

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	21	14868	S06 W01	217	200	1.5									
77	7	22	14868	S07 W14	219	100	1.5									

MCMATH REGION 14861 CMP DATE 22.1 RETURN OF REGION 14813 ROTATION 3

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	16	14861	N25 E70	213	400	1.0									
77	7	17	14861	N25 E56	215	500	1.5									
77	7	18	14861	N24 E43	215	600	3.0									
77	7	19	14861	N24 E30	214	500	2.5									
77	7	20	14861	N24 E17	215	400	1.5									
77	7	21	14861	N24 E05	211	500	1.5									
77	7	22	14861	N24 W07	212	400	1.0									
77	7	23	14861	N24 W20	212	400	1.0									
77	7	24	14861	N25 W32	211	400	1.0									

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MCMATH REGION 14861 (CONT) CMP DATE 22.1 RETURN OF REGION 14813 ROTATION 3

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	25	14861	N25 W45	210	500	1.0									
77	7	26	14861	N25 W58	211	400	1.0									
77	7	27	14861	N25 W71	210	300	1.0									

MCMATH REGION 14855 CMP DATE 22.7 RETURN OF REGION 14815 ROTATION 3

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	15	14855	S22 E90	208	600	2.0									
77	7	16	14855	S23 E75	208	4000	3.0									
77	7	17	14855	S23 E64	207	3500	3.0									
77	7	18	14855	S23 E51	207	3100	3.0									
77	7	19	14855	S23 E38	206	3000	2.5									
77	7	20	14855	S23 E27	205	2800	2.5									
77	7	21	14855	S23 E13	203	3000	2.5									
77	7	22	14855	S23 E00	205	2700	2.5									
77	7	23	14855	S23 W13	205	2700	2.5									
77	7	24	14855	S23 W25	204	2500	2.5									
77	7	25	14855	S23 W38	203	2500	2.5									
77	7	26	14855	S23 W51	204	2300	2.0									
77	7	27	14855	S23 W64	203	2500	2.0									
77	7	28	14855	S23 W77	203	1500	1.0									

MCMATH REGION 14864 CMP DATE 23.4

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	20	14864	N16 E36	196	100	1.5	19814	N16 E34	196	(B)	2				
77	7	21	14864	N17 E22	194	100	1.5									

MCMATH REGION 14863 CMP DATE 24.0

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	19	14863	N21 E64	180	100	2.5	19813	N20 E62	181	(AP)	3	B	10	1	AXX
77	7	20	14863	N21 E52	180	100	2.0									
77	7	21	14863	N21 E35	181	200	2.5									
77	7	22	14863	N21 E20	185	500	2.0	19816	N19 E19	175	(AF)	2	B	20	3	BXO
77	7	23	14863	N20 E06	186	500	2.5	19816	N20 E04	187	(BF)	3	B	10	1	AXX
77	7	24	14863	N20 W08	187	400	2.5									
77	7	25	14863	N20 W22	187	500	3.0	19816	N20 W23	188	(B)	3	H	0	1	AXX
77	7	26	14863	N21 W35	188	600	3.0	19816	N19 W38	189	(B)	4	B	30	7	CRO
77	7	27	14863	N21 W49	188	800	3.0	19816	N20 W54	191	(BP)	4	B	30	4	CSI
77	7	28	14863	N21 W63	189	1000	3.0	19816	N20 W65	189	(BP)	4	B	50	5	CRI
77	7	29	14863	N21 W75	187	800	2.5	19816	N20 W78	189	X	2	B	10	2	BXO
77	7	30	14863	N21 W90	187	400	2.0									

MCMATH REGION 14879 CMP DATE 24.5

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	27	14879	N18 W39	178	200	2.5									

MCMATH REGION 14865 CMP DATE 26.2

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	20	14865	S28 E80	152	200	1.0									
77	7	21	14865	S26 E64	152	200	2.0									
77	7	22	14865	S26 E50	155	200	1.0									
77	7	23	14865	S26 E36	156	200	1.0									

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MCMATH REGION 14875 CMP DATE 26.2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	24	14875	S30 E20	159	200	2.0									
77	7	25	14875	S29 E08	157	500	2.5	19819	S30 E07	158	(AP)	3				
77	7	26	14875	S30 W05	158	400	2.0	19819	S30 W08	159	(AP)	3	B	10	1	AXX
77	7	27	14875	S30 W17	156	400	2.5									
77	7	28	14875	S30 W30	156	300	2.5									
77	7	29	14875	S31 W42	154	200	2.0									
77	7	30	14875	S31 W57	154	200	2.0									

MCMATH REGION 14884 CMP DATE 26.9

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	01	14884	N22 W42		300	2.5						B	10	1	A
77	8	02	14884	N22 W56		300	1.5						B	0	1	A
77	8	03	14884	N23 W70		200	1.0									

MCMATH REGION 14866 CMP DATE 27.4 RETURN OF REGION 14822 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	20	14866	N17 E90	142	1000	1.5	19815	N15 E80	150	(AP)	4	B	80	1	HSX
77	7	21	14866	N18 E78	138	1000	2.5	19815	N16 E70	148	(AP)	3	R	80	2	HSX
77	7	22	14866	N18 E64	141	2500	2.5	19815	N15 E56	148	(AP)	4	B	80	1	HSX
77	7	23	14866	N18 E52	140	2500	3.0	19815	N15 E44	147	(AP)	4	B	50	1	HSX
77	7	24	14866	N18 E39	140	2500	3.0	19815	N14 E33	145	(BP)	5	B	60	1	HSX
77	7	25	14866	N19 E25	140	2500	3.0	19815	N16 E18	147	(AP)	4	H	60	2	CSO
77	7		14866					19820	N21 E22	143	(AF)	2				
77	7	26	14866	N19 E12	141	2400	2.5	19815	N16 E04	147	(AP)	4	B	60	1	HSX
77	7	27	14866	N19 E00	139	2800	2.5	19815	N16 W09	146	(AP)	4	B	30	2	CAO
77	7	28	14866	N19 W14	140	3000	3.0	19815	N16 W22	146	(AP)	4	B	30	1	HAX
77	7	29	14866	N20 W27	139	2500	2.5	19815	N16 W35	146	(AP)	4	B	20	1	HSX
77	7	30	14866	N20 W42	139	2500	3.0	19815	N16 W48	146	(AP)	3	B	10	1	AXX
77	7	31	14866	N20 W52	139	2100	2.5									
77	8	01	14866	N20 W65		1800	2.0									
77	8	02	14866	N20 W78		2000	2.0									

MCMATH REGION 14877 CMP DATE 27.4

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	25	14877	N36 E25	140	100	1.5									

MCMATH REGION 14873 CMP DATE 28.5

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	22	14873	S02 E83	122	400	1.0									
77	7	23	14873	S03 E66	126	100	1.0									

MCMATH REGION 14874 CMP DATE 28.5

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	22	14874	S25 E79	126	1500	3.5	19817	S24 E70	134	(AP)	2	B	10	2	BXO
77	7	23	14874	S24 E67	125	2000	3.5	19817	S24 E58	133	(BP)	3	B	30	5	BXO
77	7	24	14874	S24 E52	127	1800	3.0	19817	S24 E45	133	(BP)	3	B	10	11	BXO
77	7	25	14874	S24 E37	128	2500	3.5	19817	S25 E33	132	(BP)	3	H	30	8	CRO
77	7	26	14874	S25 E25	128	2000	3.0	19817	S24 E17	134	(BP)	3	B	20	5	BXI
77	7	27	14874	S25 E13	126	2200	3.0	19817	S24 E04	133	(BP)	3	B	10	3	AXX
77	7	28	14874	S25 W01	127	2300	3.0									
77	7	29	14874	S24 W15	127	1800	2.5									
77	7	30	14874	S24 W30	127	1800	3.0	19821	S26 W26	124	(AF)	3				
77	7	31	14874	S24 W40	127	1600	2.5	19821	S19 W49	134	(AP)	3	B	10	1	AXX
77	8	01	14874	S24 W55		2300	4.0	19821	S21 W62				B	10	1	A
77	8	02	14874	S29 W69		1900	2.5									
77	8	03	14874	S27 W83		600	1.0									

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MCMATH REGION 14882 CMP DATE 29.0

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	31	14882	N07 W33	120	100	2.0									

MCMATH REGION 14883 CMP DATE 29.2

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	31	14883	N28 W30	117	100	2.5	19822	N28 W32	117	(B)	2				
77	8	01	14883	N29 W44		800	3.5	19822	N29 W46		(BP)	4	B	60	9	C
77	8	02	14883	N29 W57		1100	3.0	19822	N29 W61		(BP)	4	B	60	4	C
77	8	03	14883	N29 W70		700	3.0	19822	N28 W72		(B)	3		10	1	A
77	8	04	14883	N29 W82		500	3.0									

MCMATH REGION 14872 CMP DATE 29.7

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	22	14872	N39 E85	120	900	1.0									
77	7	23	14872	N38 E74	118	700	1.5									
77	7	24	14872	N38 E62	117	700	1.5									
77	7	25	14872	N38 E49	116	700	2.0									
77	7	26	14872	N38 E40	113	700	2.0									
77	7	27	14872	N38 E28	111	400	1.5									
77	7	28	14872	N38 E16	110	400	1.5									
77	7	29	14872	N38 E02	110	400	1.0									
77	7	30	14872	N38 W13	110	400	1.5									
77	7	31	14872	N38 W24	111	500	1.0									
77	8	01	14872	N38 W36		400	1.0									
77	8	02	14872	N38 W50		400	1.0									
77	8	03	14872	N38 W64		300	1.0									

MCMATH REGION 14885 CMP DATE 30.5

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	01	14885	N02 W26		100	2.5									

MCMATH REGION 14886 CMP DATE 31.0

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	02	14886	N13 W33		200	2.5									
77	8	03	14886	N13 W46		200	1.0									

MCMATH REGION 14876 CMP DATE 31.3 RETURN OF REGION 14841 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	24	14876	N23 E90	89	600	1.0									
77	7	25	14876	N23 E73	92	600	1.5									
77	7	26	14876	N23 E63	90	500	1.5									
77	7	27	14876	N23 E50	89	400	1.5									
77	7	28	14876	N24 E35	91	400	1.5									
77	7	29	14876	N25 E23	89	400	1.0									
77	7	30	14876	N26 E08	89	400	1.0									
77	7	31	14876	N26 W05	92	400	1.0									
77	8	01	14876	N28 W14		400	1.0									
77	8	02	14876	N29 W27		400	1.0									
77	8	03	14876	N29 W43		300	1.0									

Note: Calcium spectroheliograms were secured at the McMath-Hulbert Observatory each day of July 1977.
Sunspot observations were made at Mt. Wilson each day of July 1977.

DAILY CALCIUM PLAGE INDEX

JULY 1977

YR	MO	DAY	INDEX	YR	MO	DAY	INDEX	YR	MO	DAY	INDEX
77	7	1	14.6	77	7	11	8.9	77	7	21	9.0
77	7	2	12.0	77	7	12	*	77	7	22	11.2
77	7	3	12.1	77	7	13	3.4	77	7	23	14.8
77	7	4	11.0	77	7	14	2.3	77	7	24	15.7
77	7	5	7.9	77	7	15	0.9	77	7	25	20.9
77	7	6	7.8	77	7	16	2.8	77	7	26	16.4
77	7	7	5.7	77	7	17	4.6	77	7	27	17.8
77	7	8	6.2	77	7	18	7.1	77	7	28	17.5
77	7	9	5.4	77	7	19	6.8	77	7	29	10.8
77	7	10	5.9	77	7	20	6.8	77	7	30	11.5
								77	7	31	8.2

* NO OBSERVATIONS

SUDDEN IONOSPHERIC DISTURBANCES

JULY 1977

DAY	UNIVERSAL TIME				WIDE SPREAD INDEX	NUMBER OF STATION REPORTS BY TYPE							KNOWN FLARE	McMATH REGION
	START	END	MAX	IMP		SWF	SCNA	SEA	SPA	LF-SPA	SES	SFD		
01	0852U	0945	0912	1-	1			1					0902	14822
08	0345	0452	0354	1-	1				1				0340	14841
22	1157	1220	1159	1-	1	1							1155E	14866

PERIODS OF NO OBSERVATIONS:

DATE	TIME (UT) and STATION
01-31	0000-2400 A36
01-22	0000-2400 A34
01-05	0000-2400 A4
06	1100-1417 MC
07	1705-2125 UM (18 kHz)
13	1902-1932 TM
15-16	0000-2400 TN
19	0402-0459 TM
20-31	0000-2400 A4
22-24	1700-1320 MC
25-28	0000-2400 A30, 0000-0200 A35

STATIONS REPORTING FOR JULY 1977

AAVSO (A1, A4, A21, A30, A31, A34,
A35, A36, A37, A40) (SES)
(A1, A26, A31) (SEA) (A31) (SWF)
DARMSTADT (DA) (SWF)
HAWAII (HA) (SFD)
HERSTMONCEUX (HC) (SEA)
HIRAISO (HI) (SWF)
HOBART (TA) (SEA, SES)
HUANCAYO (HU) (SWF)
INUBO (IN) (SPA)
MCMATH (MC) (SWF, SCNA)
NEW JERSEY (NJ) (SES)
PANSKA VES (PU) (SWF, SEA, SES)
SAO PAULO (UM) (SES, SPA)
SOFIA (SF) (SES)
ST CLOUD (SC) (SES)
TABLE MOUNTAIN (TM) (SPA, LF-SPA)
TORINO (TN) (SPA)
UPICE (UI) (SEA)

SID's BY McMATH REGION

JULY 1977

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
REGION																															
22	1																														
41								1																							
66																						1									
X-RAY																															
UNKNOWN																															
NO FP																															

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

JULY 1977

JUL 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
01			CULG				0000	0700	1				IIIS
	0000	0735	CULG	0000	0640		0000	0620					IS,W
	0000	0507	MANI							0217.8	0219.2	1	III
	0429	1830	DURN	0429 E	1830 D	2	0429 E	1830 D	2				IC,DC,N
	0409	1127	WEIS				0431.7	1805.7	2				IIIN
			WEIS				0539.5	0539.8	2				IIIG
	0512	0959	MANI							0539.8	0540.5	1	III
			CULG				0539	0540	2				IIIG
	0914	2420	SGMR							1232.2	1232.6	1	III
			SGMR							1303.9	1304.2	1	III
	1132	1843	WEIS				1407.2	1407.7	2				IIIG
			SGMR							1407.5	2420.0	1	CONT
	1215	2245	HARV				1408		3	1408		3	IIIG
			HARV				1442		1	1442		1	IIIB
			HARV				1655		2				IIIG
	2036	2400	CULG	2105	2400		2105	2400					IS,W
			CULG				2105	2400					IIIS,W
	2134	2400	MANI										
02	0000	0959	MANI										
	0000	0736	CULG	0000	0321		0000	0650					IS,W
			CULG				0000	0705					IIIN,W
			CULG				0402	0402.5	1				IIIG
			CULG				0405.5		1				IIIB
	0409	1351	WEIS				0421.6	1650.7	2				IIIN
	0429	1831	DURN	0429 E	1830	1	0429 E	1830	1				IC,DC,N
			CULG				0542		1				IIIB
	0914	2420	SGMR										
	1215	2245	HARV										
	1455	1842	WEIS										
	2036	2400	CULG	2107	2111		2107	2245					IS,W
			CULG				2110	2240					IIIS,W
			CULG				2131	2132	1				IIIG
	2134	2400	MANI										
			CULG				2240	2400					IIIN,W
03	0000	0736	CULG				0000	0624					IIIN,W
	0000	0959	MANI										
	0430	1831	DURN	0430 E	1831 D	1	0430 E	1831 D	1				IC,DC,N
	0410	1842	WEIS				0443.2	0925	1				IIIN
	0915	2420	SGMR							1130.0	2420.0	1	CONT
	1215	2245	HARV										
	2036	2400	CULG	2110	2400		2110	2400					IS,W
	2134	2400	MANI										
			CULG				2135	2400					IIIN,W
04	0000	0720	CULG	0000	0642		0000	0652					IN,W
			CULG				0000	0630					IIIN,W
	0000	0959	MANI										
			CULG				0321	0322	1				IIIG
	0412	0643	WEIS										
	0431	1316	DURN	0431 E	1316 D	2	0431 E	1316 D	2				IC,DC,N
	0916	2419	SGMR							0916.0	2420.0	1	CONT
	1215	2245	HARV				1224	1415	1				INW
			CULG				2134	2400					IIIN,W
	2134	2400	MANI										
	2036	2400	CULG	2137	2400		2113	2400					IN,W
05			CULG				0000	0645					IIIN,W
	0000	0736	CULG	0000	0032		0000	0145					IN,W
	0000	0959	MANI										
	0412	1032	WEIS				0906.7	1706.5	1				IIIN
	0916	2419	SGMR										
	1022	1313	DWIN				1022	1313	1				IS
	1211	1842	WEIS										
	1230	2245	HARV										
	2036	2400	CULG				2109	2400					IS,W
			CULG				2126	2400					IIIN,W
	2135	2400	MANI										
06	0000	0959	MANI										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

JULY 1977

JUL 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
06			CULG				0000	0730					IIIN,W
	0000	0736	CULG				0000	0438					IS,W
			CULG				0438	0700	1				IS
			CULG	0656	0657								IS,W
	0722	1417	WEIS										
	0917	2419	SGMR										
	1250	1831	OURN	1250 E	1831 O	1	1250 E	1831 O	1				IC,N
			OURN	1518.1	1518.1	1	1518.1	1518.1	1				III
			OURN	1546.4	1546.6	3							IIIG
	1428	1842	WEIS				1708.9	1709.2	1				IIIG
			WEIS				1827.8	1828	2				IIIG
			OURN	1827.8	1827.9	2	1827.8	1828.9	3				IIIG
	1230	2245	HARV				1828		2				IIIG
	2135	2400	MANI										
	2036	2400	CULG				2323						IIIB,W
			CULG	2327.5			2327.5						IIIB,W
07	0432	1831	OURN	0432	1831		0432	1831					IW,N
	0415	0516	WEIS				0452.9	0453.6	2				IIIG
	0000	0959	MANI							0453.2	0453.7	2	III
	0000	0737	CULG	0453	0453.5	1	0453	0454	2				IIIG
			CULG				0648	0654					IIIG,W
	0850	1103	WEIS										
	0917	2418	SGMR										
	1107	1312	WEIS										
	1230	1417	HARV										
	1404	1842	WEIS										
	1446	2245	HARV										
	2037	2400	CULG	2109	2111								IN,W
	2135	2400	MANI										
08	0000	0959	MANI										
	0000	0528	CULG				0255						IIIB,W
			CULG				0322						IIIB,W,U
	0415	0622	WEIS										
	0433	1831	OURN										
	0645	0736	CULG										
	0918	2418	SGMR										
	1230	2245	HARV										
	2036	2400	CULG										
	2135	2400	MANI										
09	0000	0959	MANI										
	0000	0736	CULG										
	0433	1831	OURN	0818.4	0818.9	3							IIIG
	0919	2418	SGMR										
	1230	2245	HARV				2036	2045	2				UNCL
	2135	2400	MANI										
	2038	2400	CULG				2150						IIIB,W
			CULG				2333	2334	1				IIIG,U
10	0000	0959	MANI										
	0000	0737	CULG				0251	0315	1				II
	0433	0715	OURN										
	0731	1831	OURN										
	0920	2417	SGMR										
	1230	2245	HARV										
	2038	2400	CULG	2104	2105	1							FAST DRIFT
	2137	2400	MANI										
11	0000	0118	MANI										
	0000	0336	CULG										
	0300	0959	MANI										
	0340	0554	CULG										
	0433	1831	OURN										
	0558	0738	CULG										
	0920	2417	SGMR										
	1230	2245	HARV										
	2137	2400	MANI										
	2038	2400	CULG				2325	2330					IIIG,V,U,W

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

JULY 1977

JUL 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
12	0000	0549	MANI										
	0000	0738	CULG				0042	0115	1				IIIS
			CULG				0104	0110	1				UNCLF
			CULG				0434						IIIB,W
	0434	1830	DURN										
	0610	0959	MANI										
	0921	2416	SGMR										
	1230	2034	HARV										
	2038	2400	CULG										
	2126	2245	HARV										
	2137	2400	MANI										
13	0000	0534	MANI										
	0000	0737	CULG				0231	0232	1				IIIG,U
	0700	0959	MANI										
	0922	2416	SGMR										
	0434	1831	DURN	1040.6	1042.5	1	1040.6	1042.5	3				IIIG
	0759	1805	WEIS				1040.7	1041.8	2				IIIG
	1230	2245	HARV										
	1810	1858	WEIS										
	2038	2400	CULG										
	2137	2400	MANI										
14	0000	0959	MANI										
	0000	0731	CULG										
	0417	1022	WEIS										
	0435	0456	DURN										
	0923	2415	SGMR										
	0509	1831	DURN	1146.8	1168.3		1146.8	1148.3					IIIG,W
			DURN	1153.6	1154.0	1	1153.6	1154.0	1				IIIG
	1230	2245	HARV										
	1320	1333	WEIS										
	1350	1837	WEIS										
	2039	2400	CULG										
	2137	2400	MANI										
15	0000	0959	MANI										
	0000	0730	CULG										
	0420	1810	WEIS										
	0436	1831	DURN										
	0923	2414	SGMR										
	1230	2245	HARV										
	2040	2400	CULG										
	2138	2400	MANI										
16	0000	0959	MANI										
	0437	1831	DURN										
	0000	0738	CULG				0636	0640					IIIG,W
	0703	1810	WEIS										
	0924	2414	SGMR										
	1230	2245	HARV										
	2035	2400	CULG										
	2138	2400	MANI										
17	0000	0959	MANI										
	0000	0737	CULG										
	0420	1835	WEIS										
	0437	1654	DURN										
	0925	2413	SGMR										
	1230	2245	HARV										
	1707	1830	DURN										
	2036	2400	CULG										
	2138	2400	MANI										
18	0000	0959	MANI										
	0000	0702	CULG										
	0424	0719	WEIS										
	0437	0646	DURN										
	0715	0738	CULG										
	0844	1834	WEIS										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

JULY 1977

JUL 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
18	1230	2245	HARV										
	2038	2400	CULG										
	2138	2400	MANI										
			SGMR										
19	0000	0959	MANI										
	0000	0738	CULG				0037.5		1				IIIB,U
	0825	1657	WEIS										
	1230	2245	HARV										
	1715	1834	WEIS										
	1730	2412	SGMR										
	2139	2400	MANI										
	2035	2400	CULG				2307	2326	1				IV
20	0000	0738	CULG										
	0000	0959	MANI										
	0425	1832	WEIS										
	0928	2411	SGMR										
	1230	2245	HARV										
	2050	2400	CULG										
	2139	2400	MANI										
21	0000	0959	MANI										
	0000	0738	CULG										
	0426	0930	WEIS										
	0440	1831	DURN										
	0930	2410	SGMR										
	1000	1832	WEIS										
	1230	1705	HARV										
	1713	1915	HARV										
	1926	2245	HARV										
	2039	2400	CULG										
	2139	2400	MANI										
22	0000	0959	MANI										
	0000	0738	CULG										
	0930	2409	SGMR										
	0427	1619	WEIS				1520.7	1521.7	2				IIIG
	1230	2245	HARV				1520	1521	3				IIIG
	1622	1830	WEIS										
	0441	1831	DURN	1713.4	1713.7	1							IIIG
			DURN	1730.1	1730.7	1							IIIG
			DURN	1813.7	1813.9	3							IIIG,RS
	2039	2400	CULG										
	2139	2400	MANI										
23	0000	0959	MANI										
	0000	0724	CULG	0058	0059	1							FAST DRIFT
			CULG	0110.5	0111.5	1							FAST DRIFT
			CULG	0120	0120.5	1							FAST DRIFT
	0428	1830	WEIS										
	0441	1817	DURN										
	0931	2408	SGMR										
	1230	2245	HARV										
	2039	2400	CULG										
	2139	2400	MANI										
24	0000	0959	MANI										
	0000	0738	CULG										
	0430	0931	WEIS										
	0442	1832	DURN										
	0931	2407	SGMR										
	0945	1828	WEIS										
	1230	2139	HARV										
	2039	2400	CULG										
	2140	2400	MANI										
	2236	2245	HARV										
25	0000	0207	MANI										
	0212	0959	MANI										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

JULY 1977

JUL 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
25	0000	0738	CULG				0353		1				IIIB
	0442	1831	DURN										
	0451	1537	WEIS										
	0932	2406	SGMR										
	1244	2245	HARV										
	1545	1827	WEIS										
	2039	2400	CULG										
	2140	2400	MANI										
26	0000	0959	MANI										
	0000	0739	CULG	0315.5	0318		0315.5	0318					IIIG,W
	0442	0552	DURN										
	0601	1830	DURN										
	0734	1554	WEIS										
	0933	2405	SGMR										
	1215	2245	HARV										
	1721	1826	WEIS										
	2036	2400	CULG										
	2141	2400	MANI										
27	0000	1002	MANI										
	0000	0738	CULG										
	0443	0845	DURN										
	0717	0939	WEIS										
	0934	2404	SGMR										
	0952	1041	WEIS										
	1104	1459	WEIS										
	1230	2245	HARV										
	1523	1648	WEIS										
	1718	1735	DURN										
	1810	1832	DURN										
	2039	2400	CULG										
	2141	2400	MANI										
28	0000	1002	MANI										
	0000	0726	CULG										
	0718	1823	WEIS				1526.3	1526.8	1				IIIG
			WEIS				1640.2	1640.6	2				IIIG
			WEIS				1715.9	1716.2	2				IIIG
	1230	2245	HARV				1716		2				IIIG
			WEIS				1726.5	1727.0	2				IIIG
	0443	1832	DURN				1726.6	1726.9	3				IIIG
			HARV				1726	1727	2				IIIG
			WEIS				1804.6	1804.8	1				IIIB
			DURN				1804.7	1804.8	2				III
			HARV				1805		2				IIIB
	0935	2403	SGMR							1856.0	1857.0	1	III
			HARV				1856	1858	3				IIIG
	2054	2400	CULG										
	2141	2400	MANI										
29	0000	1007	MANI										
	0000	0332	CULG				0024.5	0025.5	1				IIIG
	0348	0532	CULG										
	0444	1832	DURN										
	0720	1727	WEIS										
	0936	2402	SGMR										
	1230	2245	HARV										
	2039	2400	CULG										
	2141	2400	MANI										
30	0000	1009	MANI										
	0000	0738	CULG				0006.5	0007.5					IIIG,W
	0649	1832	DURN										
	0937	2401	SGMR										
	1250	2245	HARV										
	2038	2400	CULG										
	2141	2400	MANI										
31	0000	1009	MANI										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

JULY 1977

JUL 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
31	0000	0738	CULG										
	0927	1832	OURN										
	0938	2400	SGMR										
	1245	2245	HARV										
	1338	1353	WEIS										
	1413	1453	WEIS										
	1504	1558	WEIS										
	1624	1820	WEIS										
	2039	2400	CULG										
	2141	2400	HANI										

The symbols used in connection with the spectral type in describing the important bursts are as follows:

B = Single burst
G = Small group (< 10) of bursts
GG = Large group (> 10) of bursts
C = Underlying continuum (particularly with type I)
S = Storm in the sense of intermittent but apparently connected activity
N = Intermittent activity in this period
U = U-shaped burst of Type III
RS = Reverse slope burst
DP = Drifting pairs
DC = Drifting Chains
H = Herringbone
W = Weak
P = Pulsations
CONT = Continuum
UNCLF = Unclassified activity

COSMIC RAY INDICES

(Neutron Monitors)

JULY 1977

July 1977	THULE Average cts/hr	ALERT Average cts/hr	DEEP RIVER Average cts/hr	CALGARY Average cts/hr	SULPHUR MT Average cts/hr	KIEL Average cts/hr	CLIMAX Average cts/hr	TOKYO Average cts/hr	KULA Average cts/hr
1	Data not available at time of publication	7304.9	6878.2	11453.9	8792.8	6194.3	4141.6	5399.3	1204.8
2		7272.2	6858.9	11434.6	8799.4	6168.7	4128.6	5399.9	1204.4
3		7288.6	6870.0	11477.3	8812.3	6181.0	4131.5	5407.1	1206.9
4		7328.2	6873.2	11518.0	8845.9	6211.9	4154.9	5408.4	1210.1
5		7373.7	6920.6	11525.2	8920.7	6250.5	4171.6	5427.4	1209.2(23)
6		7438.3	6963.1	11603.8	8969.2	6275.2	4181.5	5432.9	1209.4
7		7436.3	6975.3	11571.9	8937.0	6284.8	4197.1	5445.5	1215.0
8		7414.7	6934.0	11598.6	8923.8	6265.2	4176.7	5458.6	1212.8
9		7394.9	6942.6	11601.1	8921.1	6257.3	4180.0	5439.3	1211.0(23)
10		7386.6	6927.4	11564.8(22)	8899.4	6249.4	4168.2	5411.5	1209.7
11		7374.2	6908.3	11547.4(8)	8873.8	6227.3	4157.9	5400.8	1208.6(23)
12		7357.2	6898.8	11526.7	8876.9	6232.4	4157.0	5410.5	1207.4
13		7369.6	6917.8	11526.2	8900.3	6249.0	4161.2	5411.1	1209.6
14		7392.5	6961.6	11698.5	8936.9	6283.4	4187.7	5414.0	1214.0
15		7355.1	6919.5	11658.5	8908.4	6266.9	4179.7	5414.6	1209.6
16		7324.1	6875.1	11614.8	8873.9	6224.8	4151.8	5406.6	1207.2
17		7347.3	6878.4	11608.2	8853.0	6236.2	4153.4	5408.3	1207.1
18		7359.0	6894.3	11597.5	8897.3	6260.5	4169.2	5417.4	1206.9(23)
19		7319.0	6868.1	11488.6	8852.2	6230.3	4155.5	5411.4	1207.4
20		7326.2	6858.0	11453.2	8818.4	6221.3	4147.0	5406.5	1204.3
21		7331.2	6875.3	11461.1	8811.2	6209.7	4139.6	5413.8	1204.8
22		7337.1	6923.3	11501.7	8860.7	6215.0	4153.7	5425.5	1205.9
23		7386.3	6943.8	11546.4	8910.0	6237.9	4163.2	5445.8	1207.1
24		7408.3	6960.8	11624.7	8961.7	6290.6	4190.8	5446.1	1208.6
25		7434.4	6985.8	11681.5	9014.8	6322.6	4204.9	5440.1	1213.4(23)
26		7443.0	7027.7	11694.4	9046.3	6330.1	4212.7	5446.9	1214.1
27		7475.8	7038.0	11710.6	9049.4	6321.8	4217.7	5449.9	1213.0
28		7492.8	7052.3	11691.9	9107.5	6325.3	4234.1	5453.2	1214.5
29		7438.0	6944.1	11591.8	8955.1	6291.6	4223.9	5453.9	1214.3
30		7377.4	6942.0	11537.8	8928.9	6280.1	4206.8	5436.1	1213.4
31		7401.8	6965.8	11552.6	8955.2	6287.8	4212.7	5426.2	1211.8
MEAN		7377.1	6928.4	11569.8	8910.1	6254.3	4174.7	5424.8	1209.6

( ) Number of hours for which data are available if less than 24. Number of Section Hours at Climax if sum of both sections is less than 40 hours.

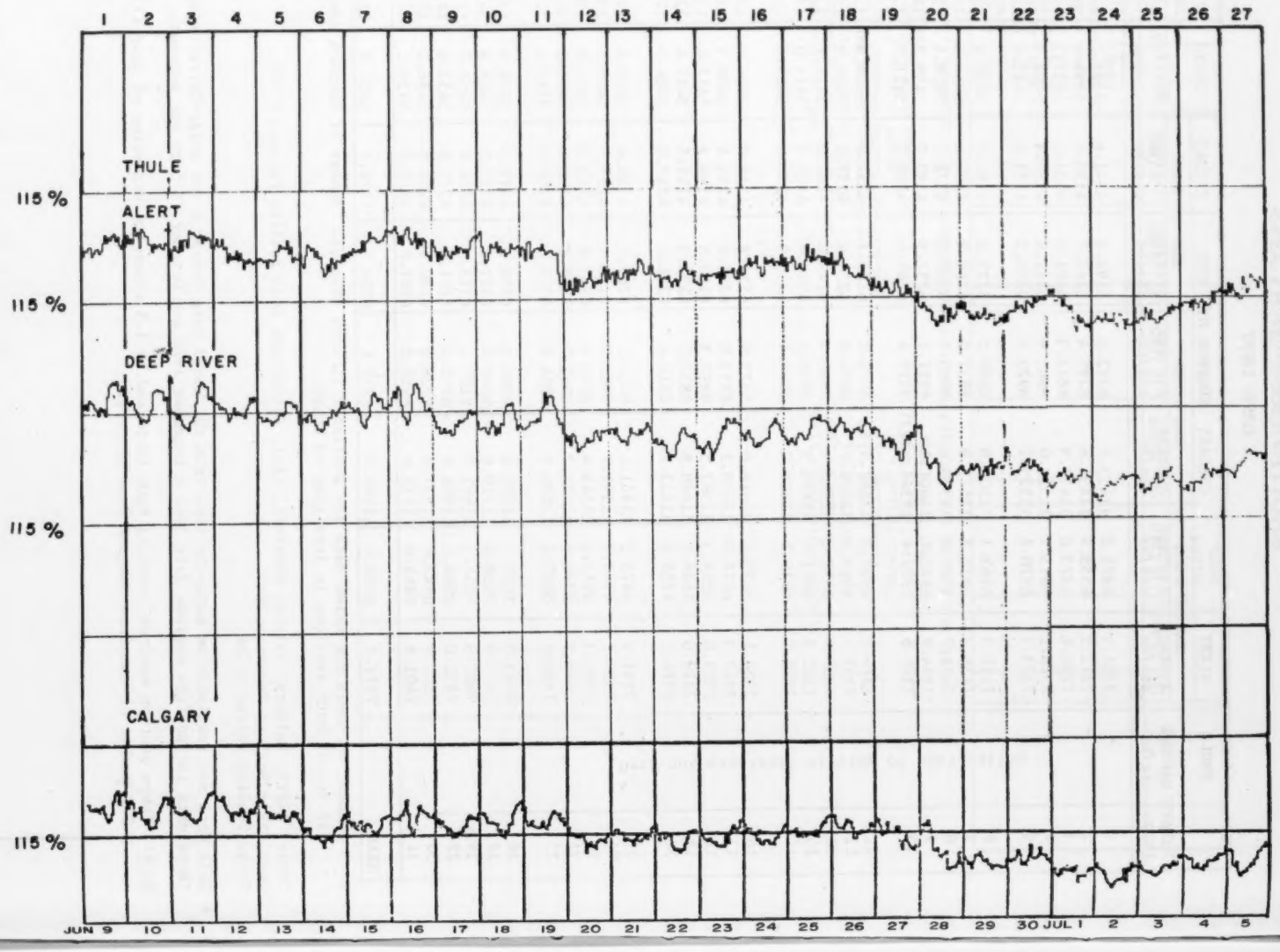
Thule, Alert, Calgary, Sulphur Mountain, Kiel, Climax and Kula Scaling Factors = 100.
Deep River Scaling Factor = 300.
Tokyo Scaling Factor = 128.

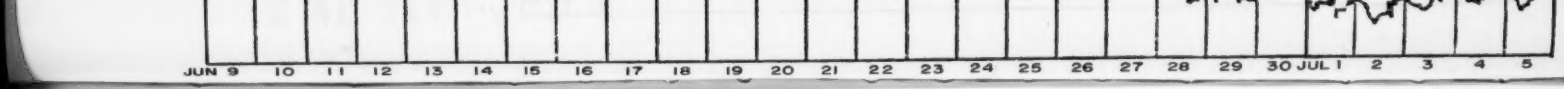
* Kula data are available on magnetic tape from the World Data Center A for Solar-Terrestrial Physics. These data include the periods July 1967 - December 1970 and October 1975 to the present.

Note: Tokyo neutron monitor counting rate increased by 1.5 since the beginning of June 1977. The number of counters changed from 18 to 27.

COSMIC RAY INDICES
(Neutron Monitors)

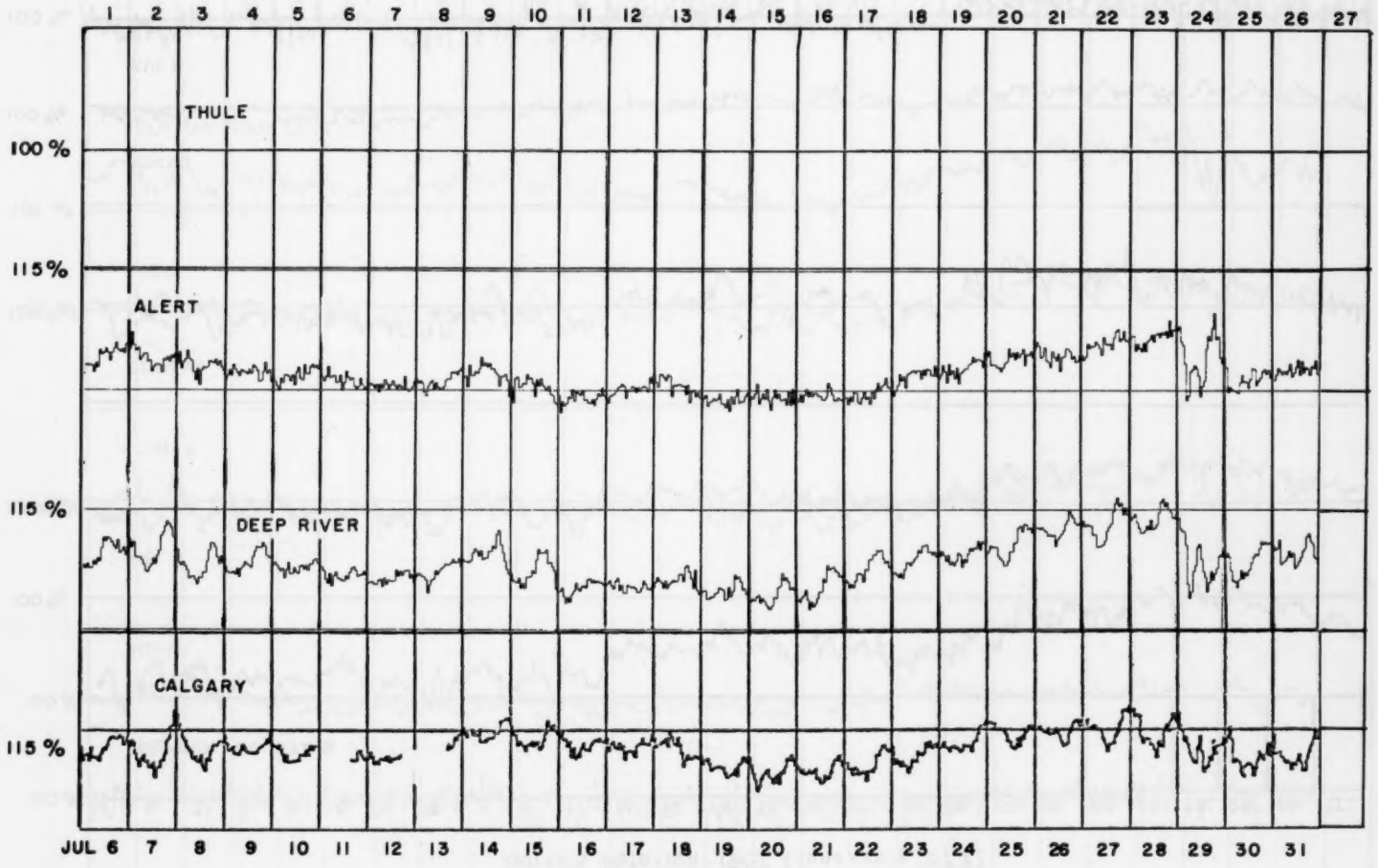
Bartels Rotation 1967 (June - July 1977)





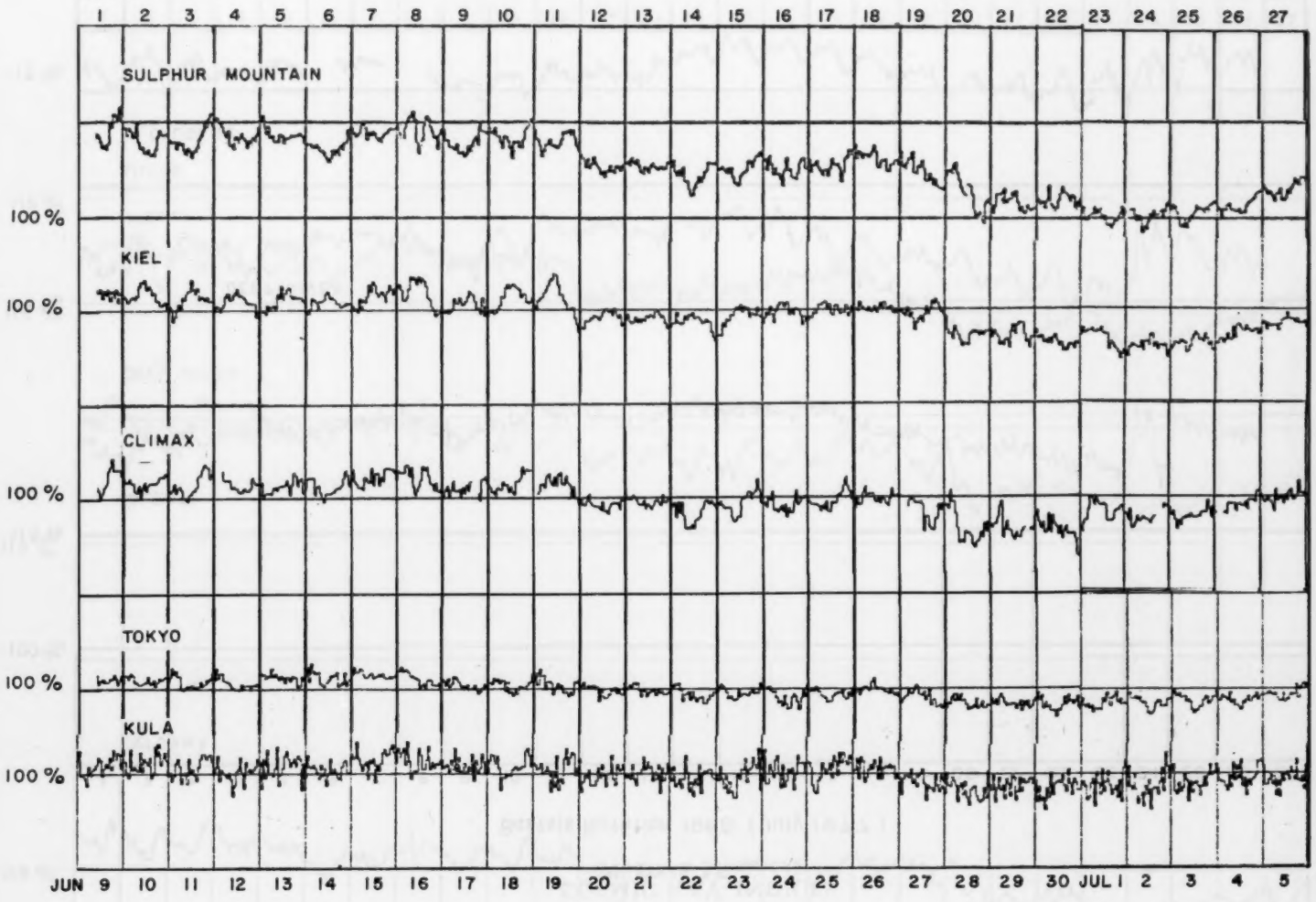
COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1968 (July 1977)



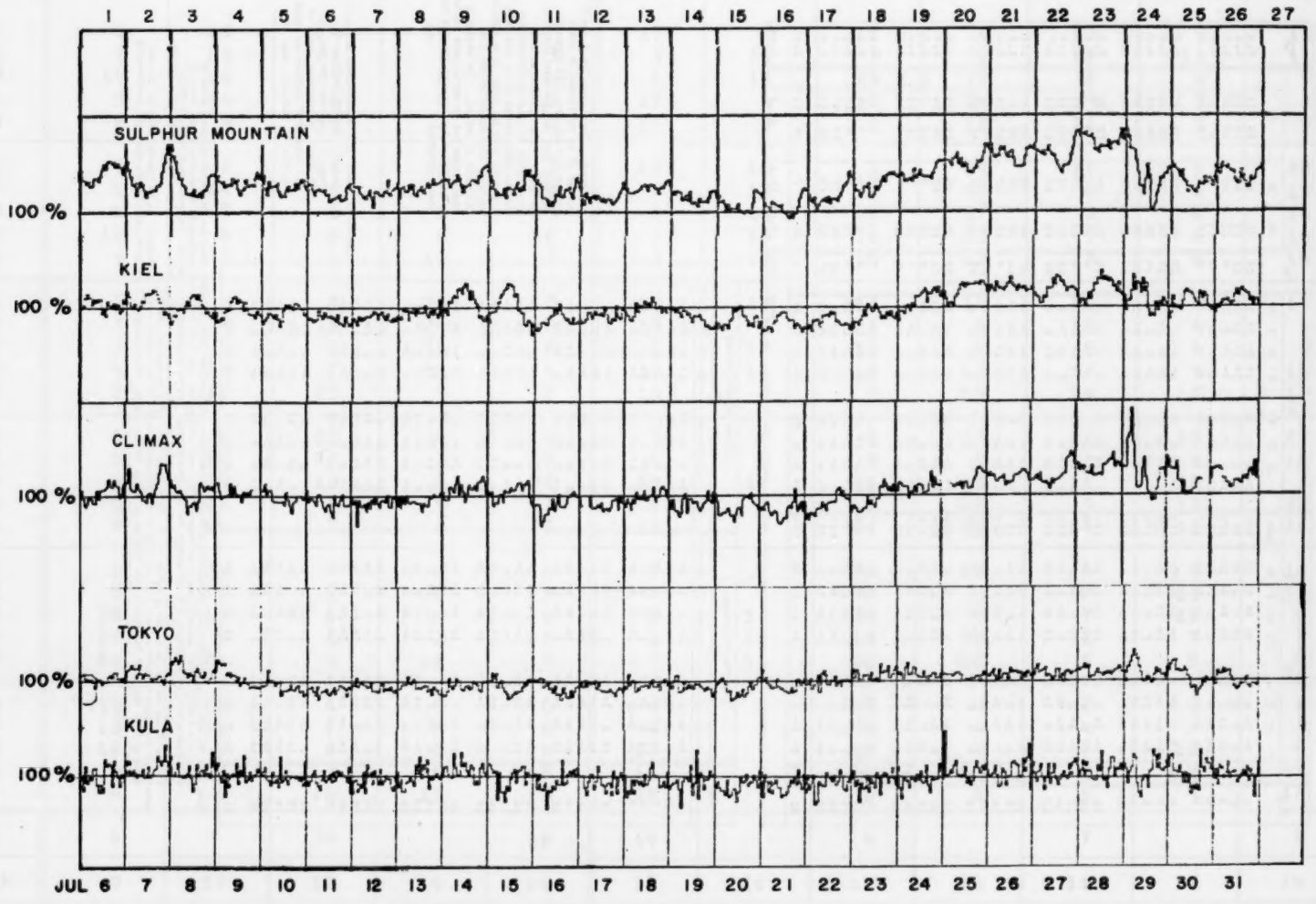
COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1967 (June-July 1977)



COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1968 (July 1977)



GEOMAGNETIC ACTIVITY INDICES

JULY 1977

Day	Three-Hourly Indices Kp									Three-Hourly Indices Km								Ap	aa					Cp
		1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8		N	S	M		
1		3-	2+	4	4	2-	3+	3	2+	23+	3-	3	4-	4-	1+	3-	2+	2	15	31	15	26	21	0.9
2		3	2	2	2	2+	3	3	3-	20	3-	2	2+	2	2-	3-	3-	2+	11	28	13	18	23	0.6
3		1+	1+	2	2	3+	3-	2+	2-	17-	1+	1	2+	2+	3-	2+	2	1+	9	23	10	12	22	0.5
4		2+	2+	3	2	1	1	1	3	16-	2+	2	3	2	1-	1	1-	3-	8	23	8	19	12	0.5
5	Q6	2-	0+	0+	2-	2-	2+	2-	1+	11	1+	1-	1-	2-	3-	2+	1+	1+	5	16	16	18	22	0.2
6	Q4	1+	1-	2-	3	6-	5+	4+	5-	27-	2-	1-	2	3+	4+	4-	3	4-	28	49	23	15	57	1.2
7		5-	4-	4-	2	2+	1+	2-	2+	22-	4	4-	3+	2	2+	2-	1+	3-	15	25	21	31	16	0.8
8		3-	4-	2+	3+	3	3	2+	3	23+	3	4-	2	3	3-	3	2	3	14	30	19	24	26	0.8
9		3+	3-	3-	3	2+	3-	4	4-	24+	3	3-	2+	3+	2	3-	3+	3+	16	36	18	26	30	0.9
10		4	3+	2	2	3-	3-	3+	3	23	4	3	2	2+	3	3-	3	3	14	31	24	24	31	0.8
11		3-	3+	3	2-	2-	1+	2+	2-	18-	3	3+	3+	2-	2	1+	2+	2	10	21	14	22	14	0.5
12	Q4	1+	1	1-	1+	0+	0+	1+	1+	8-	1+	1	1-	1	1-	1-	1-	1+	4	13	4	9	8	CC 0.1
13		3-	3-	2	1+	2+	2	3-	2	18-	2	3	2	2-	2+	2-	3-	2	9	23	15	14	25	0.5
14		3+	5-	5-	4-	2	2-	2	1+	23+	3	5-	4	4-	2	1+	2-	1	18	31	23	43	12	1.0
15		3-	3	3-	2	2+	3-	3-	3+	21+	2+	3-	2+	2	2-	2+	2	3	12	28	12	19	21	0.7
16	Q3	3-	3-	4+	5	4	4	3+	5-	31-	2	2+	4	4+	3+	4-	3-	4-	27	48	30	36	34	1.2
17		3	3-	3	3-	2-	3	3+	4-	23	3-	3-	3	3	1+	3-	3+	3+	14	32	22	25	31	0.8
18	Q9A	2	2-	2-	2-	3-	2+	2-	2	16-	2	2-	2-	2-	2+	1+	1+	2-	7	17	12	13	16	0.4
19	Q5	3+	2	4+	4-	4+	4+	4	3	29	3	2	4+	4-	3+	3+	3	3	23	47	30	34	43	1.1
20	Q2	4	4	5	5-	4+	3+	4-	3+	32+	3+	4-	4	4-	4	3+	3	3	29	45	38	46	38	1.3
21		4-	3-	3-	1+	2	2	2+	2	19-	3+	3-	3-	1+	2-	2+	3-	2	10	24	16	21	19	0.6
22		3	3-	3	3+	1+	2	2	2+	20-	3-	3-	3	3+	1+	2-	2-	2+	11	22	22	30	14	0.6
23	Q7	3-	2	2	1-	2-	1-	1-	1+	12-	3-	2+	2	1	2-	0+	1	1+	6	16	6	13	9	CC 0.3
24	Q6A	2-	1+	1+	2	2	2-	3-	2	15-	1+	1	1+	2	2	2	2+	2	7	21	9	11	19	C 0.3
25	Q5	2-	1+	1+	1	1+	1-	1-	2	10	2-	1+	1-	1-	1	1-	0+	2	5	12	7	9	11	CC 0.2
26	Q1	1-	1	0+	1-	1	1+	1-	0	6-	1	1+	1-	1	1-	1	1-	0	3	9	2	5	6	CC 0.1
27	Q2	0	1-	1	0+	1	0+	0+	2-	5+	0+	1-	1+	1	1	0+	1-	1+	3	9	4	4	10	CC 0.1
28	Q3	1	1	0+	1-	1	1+	1	1+	8-	1+	1+	1-	1	1	1+	1	1+	4	13	4	6	12	O 0.1
29	D1	6	7-	6	5+	7-	4+	3-	2	40-	5	6-	6-	4+	6	4-	2+	2	61	69	77	79	67	1.7
30		4+	4+	4	3+	2-	2-	2-	2-	23-	5-	4	4-	3	2-	2-	2-	1+	17	30	19	36	13	0.9
31	Q8A	3-	3-	2	2	2-	1-	1+	2+	15+	2+	3	2	2-	2-	1	1+	2+	8	22	7	16	13	C 0.4
																		Mean	14	27.8	17.4	22.3		0.65

Day	Three-Hourly Indices Kn								Three-Hourly Indices Ks							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1	3-	3-	4	4	2-	3	3	2+	3-	3	3+	3+	1+	2	2-	2-
2	3-	2	2	2	2+	3-	3-	2+	3-	2-	2+	2	1+	2+	3-	2
3	2-	1+	3-	2+	3	3-	2	2-	1-	1	2-	2	2	2	2-	1+
4	2+	2	3-	2+	1	1+	1	3	2+	2+	3	2-	0+	1-	1-	3-
5	2-	1-	1	2	2+	2+	2	2-	1	1-	1-	1+	3-	2	1	1+
6	1+	1	3-	4-	5	5-	4-	4+	2-	0+	1+	3	4-	3-	3-	3
7	4+	4-	4-	2+	3-	2	2-	2	4-	4-	3	2-	2+	1+	1	3
8	3-	3+	2+	3	3-	3	3-	3	3	4-	2	3-	3-	3	1+	3
9	3+	3-	2+	3+	2+	3-	3+	3+	3	3-	3-	3+	2-	2+	3+	4-
10	3+	3+	2+	3-	3	3-	3	3-	4+	3	2-	2-	3	3-	3+	3+
11	2+	3+	4-	2	2	2-	2+	1+	3+	3+	3	2-	2-	1	2+	3-
12	1+	1+	1+	1+	1-	1	1+	2-	2-	1	0+	1-	0+	0+	0+	1-
13	2	3	2	2	3-	2	2+	2	2-	3	2	1+	2-	1+	3-	2-
14	3	5-	5-	4	2+	2-	2	1+	3	4+	4-	4-	2-	1	2-	1-
15	3-	3	3-	2+	2+	3-	2+	3+	2+	2+	2+	1+	1+	2	2-	3-
16	2+	3-	4	4+	3+	4-	3+	4-	2-	2+	4	4	3+	4-	2+	4-
17	3	3-	3+	3	2-	3	3+	3+	3-	3-	3-	3-	1	2+	4-	3
18	2	2-	2	2	3-	2	2-	2	2	1+	2-	1	2+	1	1+	1+
19	3-	2-	4+	3+	3+	4-	3	3+	3	2	4+	4-	4-	3	3-	3
20	3+	4	5-	4	4-	3+	3	3	4-	4-	4-	3+	4	3+	3	3
21	4-	3-	3-	1+	2	2+	2+	2+	3+	3-	3-	1	1+	2	3-	2-
22	3	3-	3+	4-	2-	2	2	2+	3-	2+	3-	3-	1	1	2-	2+
23	3-	2	2+	2-	2+	1-	1+	2-	3-	3-	2-	0+	1-	0+	1-	1-
24	1+	1+	1+	2+	2+	2+	3-	2+	1+	1	1	2-	1+	1+	2	2-
25	2-	1+	1+	1+	1+	1	1-	2	2-	1	0+	0+	1-	1-	0	2-
26	1	1+	1-	1+	1+	2-	1	0	1-	1	1-	0+	0+	0	0+	0
27	1-	1-	1+	1+	1	0+	1	2-	0	1-	1	0+	1-	0	0+	1+
28	1+	1+	1	1	1+	2-	1+	2-	1+	1	0+	1	0+	1+	1-	1-
29	5+	6+	6-	5	6-	4	3-	2+	5	5+	5+	4-	6+	3	2-	1+
30	4+	4+	4-	4-	2	2-	2-	2-	5-	4	3	3-	1+	2-	2	1+
31	2+	3	2	2	2-	1	1+	2+	2+	3	2	2-	1+	1-	1+	2+

* Errata: Note that the N and M values of aa published in these tables for January 1974 through January 1977 values were slightly in error. The correct values (resulting in some modifications in the classification of the days C and K) will be given in a supplementary IAGA Bulletin and the Bulletin 32 series. The magnetic tape deposited in World Data Center A for Solar-Terrestrial Physics has been corrected.

ADDENDUM: June 197. Geomagnetic Activity Indices in SGD 396 Part I, page 111, lacked the Km, Kn, Ks data. A complete table of all June 1977 indices is found in SGD 397 Part II, page 39.

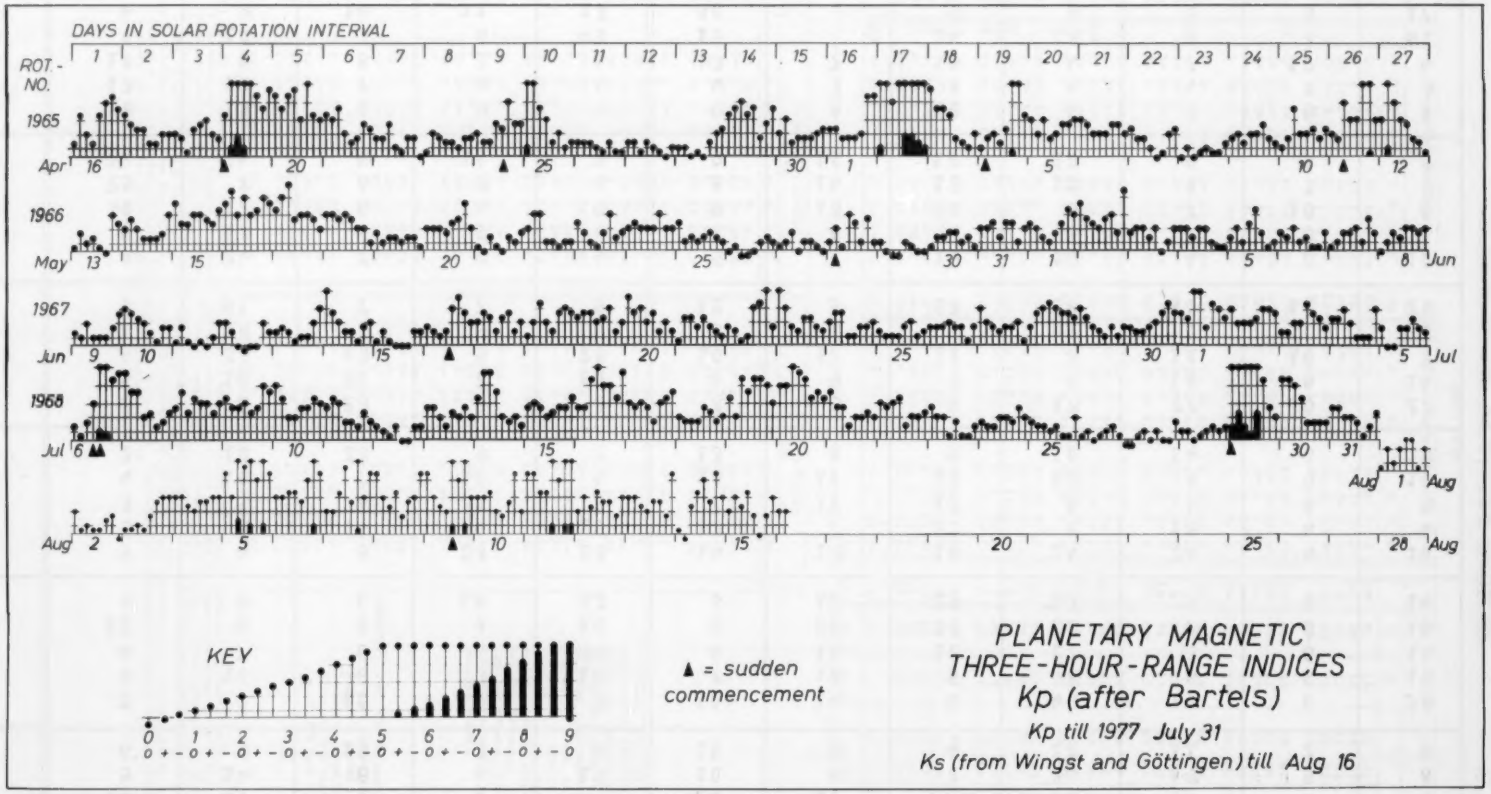
Quiet days (Q) and disturbed days (D), geomagnetic planetary three-hour-range indices (Kp) (integers alone are equivalent to those normally given with a small zero), magnetic character figures (Cp), and average amplitude (Ap) (unit 2γ) prepared by Geophysikalisches Institut at the University of Göttingen, F.R. of Germany for the International Service of Geomagnetic Indices. Ten most quiet days (Q1-Q0(10)) and five most disturbed days (D1-D5) are ordered from most quiet or disturbed, respectively. A or K means "not really quiet" (A = "Ap<6", K = "Ap <6 but one Kp >3o or two Kp values >3-"). An * means "not really disturbed" (Ap<20).

Georagnetic three-hourly indices (Kn), (Ks) and (Km) as in IAGA-Bulletin No. 32 and indices (aa), "antipodal", as in IAGA-Bulletin No. 33 prepared by P. N. Mayaud of the Institut de Physique du Globe, Paris, France. Really quiet (C) and quiet but slightly disturbed three-hourly intervals (K) are given for 24-hour and 48-hour intervals centered on 12 UT.

DAILY AVERAGE INDICES Ap

	1976					1977						
DAY	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL
1	8	10	14	10	7	17	7	11	4	13	9	15
2	8	24	21	7	3	5	21	5	5	66	14	11
3	10	10	9	6	4	6	11	4	12	15	6	9
4	5	14	6	4	15	10	4	3	24	19	5	8
5	6	9	13	3	6	15	9	4	12	11	7	5
6	5	7	11	2	3	10	14	6	49	10	5	28
7	5	10	6	3	10	7	18	5	48	6	6	15
8	4	7	6	6	23	6	18	12	27	3	6	14
9	12	6	6	8	16	6	25	38	22	7	6	16
10	9	5	6	18	13	3	12	19	13	9	8	14
11	5	4	8	23	13	14	13	18	14	24	4	10
12	3	8	14	24	15	12	7	22	8	19	4	4
13	3	5	8	31	8	7	12	13	5	6	6	9
14	4	10	7	16	4	18	11	12	12	8	9	18
15	2	10	33	9	2	13	8	5	10	14	3	12
16	6	6	29	5	8	7	6	6	17	22	10	27
17	5	10	30	7	10	6	9	9	9	18	8	14
18	4	33	19	5	28	10	17	11	8	11	10	7
19	6	20	7	9	7	8	6	5	48	5	10	23
20	5	51	7	7	5	12	5	13	28	10	11	29
21	8	24	7	4	4	5	7	10	12	4	6	10
22	5	17	5	5	8	7	8	7	6	7	10	11
23	30	12	6	4	5	6	18	14	5	7	10	6
24	25	7	6	3	6	8	14	12	11	8	7	7
25	24	24	5	11	9	9	11	12	22	5	5	5
26	18	13	4	9	6	4	8	16	4	2	6	3
27	13	12	7	8	6	4	3	8	4	4	7	3
28	10	5	5	2	6	13	7	15	4	7	12	4
29	6	10	3	6	45	15		14	18	2	7	61
30	6	9	16	11	13	30		5	8	5	9	17
31	5		34		12	19		4		7		8
MEAN	9	13	12	9	10	10	11	11	16	11	8	14

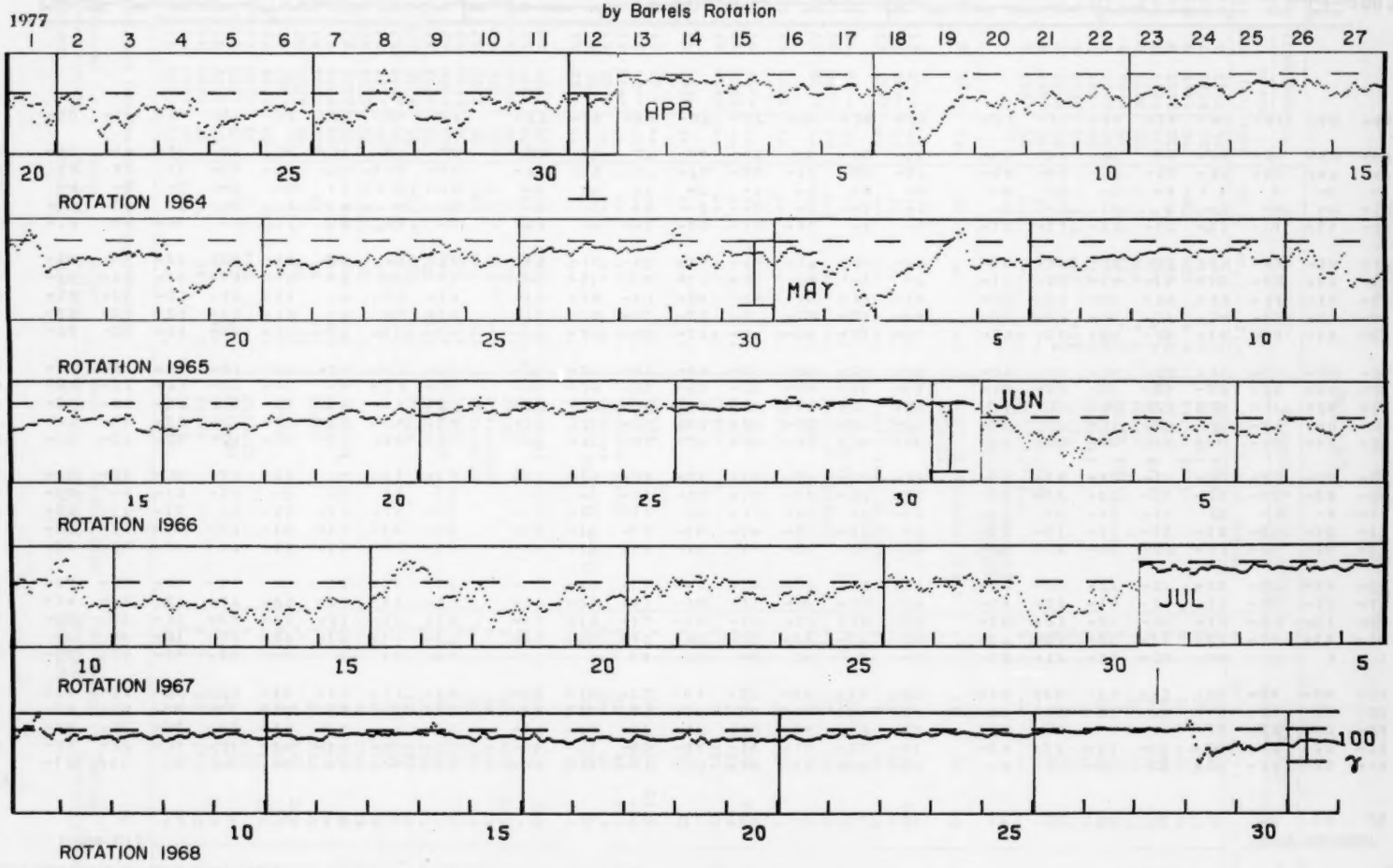
GEOMAGNETIC ACTIVITY INDICES



GEOMAGNETIC ACTIVITY INDICES

Hourly Equatorial Dst

by Bartels Rotation



Note the sensitivity indicator for each month on the last day of the month and also note that the zero reference level is different for each month.

HOURLY EQUATORIAL Dst VALUES (PROVISIONAL)

NASA/GODDARD SPACE FLIGHT CENTER

JULY 1977

(Time-UT) (Units-Gammas)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	-12	-10	-5	-4	-4	-5	-16	-21	-29	-31	-27	-30	-25	-23	-22	-13	-9	-13	-20	-22	-27	-22	-20	-24
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3	-36	-36	-31	-26	-18	-11	-7	-12	-15	-15	-17	-13	-13	-18	-23	-22	-18	-16	-16	-16	-21	-20	-23	-22
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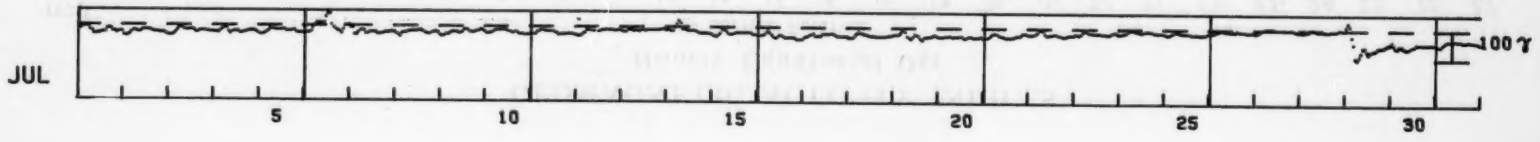


PRINCIPAL MAGNETIC STORMS

JULY 1977

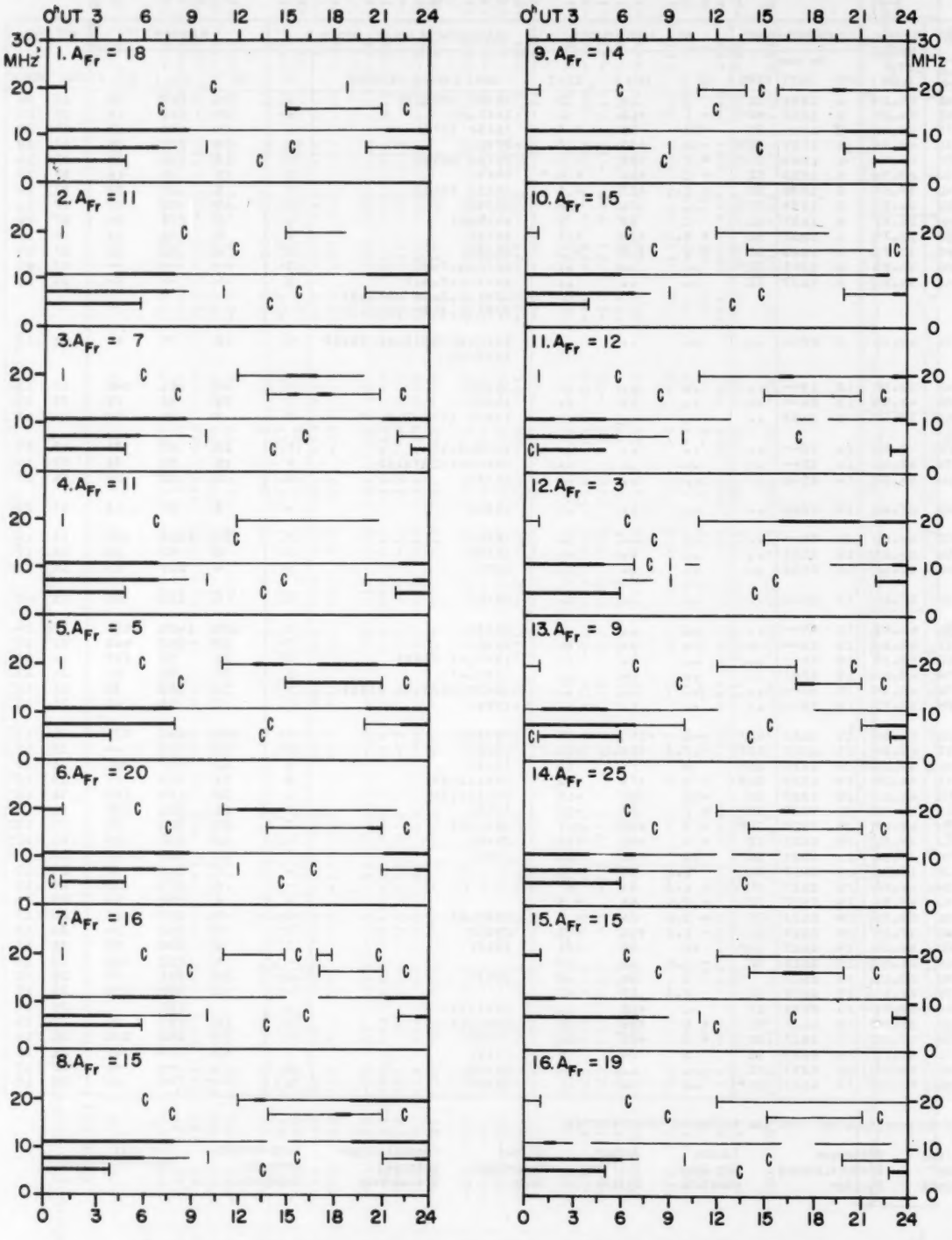
OBS. 2 letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	hr min (UT)	TYPE	SC - AMPLITUDES D(')	H(γ)	Z(γ)	MAXIMUM 3 HOUR - INDEX K DAY(3 HOUR PERIOD)	K	RANGES D(')	H(γ)	Z(γ)	UT END DAY	HOUR
NE	55.1N	6	1038	SC	3	14	3	06(8) 07(1,2)	5	25	147	97	12	04
WI	54.2N	6	1038	SC*	- 1 *	+16	0	06(5,6)	6	25	170	45	07	03
FR	49.6N	6	1344	SC	-02	-23	+ 3	06(5) 07(1)	5	19	108	35	07	09
BO	48.9N	6	1039	SC*	- 4	+25	0	07(1)	5	19	104	36	07	09
TU	40.4N	6	1039	SC*	- 2	+30	+ 2	06(6) 07(1)	5	13	100	20	07	14
SJ	29.9N	6	1038	SC	+ 2	+14	+ 4 *	06(5)	5	10	90	16	07	08
HO	07.6N	6	1038	SC	- 0.5	+23	- 1	06(5) 07(1)	5	5	85	29	07	19
GU	04.0N	6	1038	SC*	..	21	-06	06(5)	5	10	90	20	07	11
HU	00.6S	6	1037	SC	1	30	5	06(5,6)	6	5	220	36	07	06
PM	18.7S	6	1037	SC	+ 0.4	+22	+17	06(5)	5	5	90	50	07	15
HR	33.7S	6	1038	SC	+ 1	+ 5	+ 3	06(5)	5	6	65	48	07	09
KG	56.5S	6	1345	SC*	..	..	..	06(5,6,7,8)	3	--	--	--	08	06
KG	56.5S	6	1037	SC	..	..	..	06(5,6,7,8,) 07(1,2,3,8) 08(1,2) 07(1,2,3,8) 08(1,2)	3	--	--	--	08	06
TU	40.4N	8	02--	..	..	..	..	08(2,8) 09(1,8) 10(2) 11(2,3)	4	12	75	40	11	12
NE	55.1N	13	19--	..	..	..	..	16(3)	6	48	111	148	17	13
BO	48.9N	13	04--	..	..	..	..	16(3)	5	30	98	75	23	09
HO	07.6N	13	1135	..	..	..	..	13(7) 14(1,2,3,4)	3	5	91	13	14	17
FR	49.6N	14	02--	..	..	..	..	14(2,3,4)	5	20	95	38	15	09
TU	40.4N	14	02--	..	..	..	..	14(2,4) 16(3,4)	5	16	80	30	17	14
GU	04.0N	14	0146	..	..	..	..	14(3)	5	0	80	10	14	13
HO	07.6N	15	1200	..	..	..	..	16(4)	4	5	87	18	17	22
CO	64.6N	16	06--	..	..	..	..	16(4)	7	154	1250	900	17	13
GU	04.0N	16	0608	..	..	..	..	16(3)	5	0	60	10	16	17
HU	00.6S	16	0640	..	..	..	..	16(6)	5	4	108	25	16	21
HO	07.6N	18	2100	..	..	..	..	19(6)	5	5	113	33	21	03
CO	64.6N	19	05--	..	..	..	..	20(3)	7	178	1450	1120	21	09
SI	60.0N	19	06--	..	..	..	..	20(5)	7	50	560	440	21	09
NE	55.1N	19	01--	..	..	..	..	19(3,4) 20(2)	5	32	93	187	21	08
FR	49.6N	19	02--	..	..	..	..	20(3,4)	5	24	95	47	21	09
TU	40.4N	19	06--	..	..	..	..	19(3) 20(2,3) 21(1)	5	12	80	30	21	12
PM	18.7S	19	05--	..	..	..	..	19(4)	5	4	80	40	21	12
CO	64.6N	29	0027	SC*	+41	+161	-23	29(3,5)	7	200	1680	920	30	13
SI	60.0N	29	0027	SC*	-17.8	+58.2	+23.7	29(5)	8	--	--	--	30	12
NE	55.1N	29	0027	SC*	6	79	10	29(2)	8	62	657	451	30	12
WI	54.2N	29	0027	SC*	- 5 *	+78 *	- 3	29(1,2,5)	6	30	325	75	29	18
FR	49.6N	29	0027	SC	-05	+81	-15	29(1,2,3)	6	30	176	102	30	10
BO	48.9N	29	0029	SC*	+ 2	-77	-10	29(2)	7	41	226	120	31	12
TU	40.4N	29	0028	SC*	- 3	+90	+ 7	29(2,3)	7	20	200	30	30	14
SJ	29.9N	29	0027	SC	- 1	+35	+10	29(2)	6	11	134	28	29	12
HO	21.1N	29	0028	SC*	-02 *	+39	+18	29(2)	7	10	207	42	30	12
JP	17.3N	29	0027	SC	- 0.8	39	- 8		-	7	243	30	29	19
SH	14.6N	29	0027	SC	- 1.3	35	6		-	6	270	35	29	19
UJ	13.5N	29	0027	SC	- 0.4	46	- 8		-	6	240	29	29	19
AL	09.5N	29	0027	SC	- 0.6	34	- 5	29(2,5)	6	5	217	25	29	17
HO	07.6N	29	0028	SC	- 0.5	+40	- 3	29(5)	7	5	252	34	30	13
GU	04.0N	29	0027	SC*	01	65	-21	29(2)	7	0	250	30	30	13
AN	01.5N	29	0027	SC	- 1.4	45	23		-	4	232	106	29	19
HU	00.6S	29	0027		1	66	9	29(2)	6	10	291	49	29	22
TV	01.1S	29	0027	SC	0.3	37	47		-	4	292	226	29	19
PM	18.7S	29	0026	SC	..	+50	..	29(1,2)	6		220		30	15
HR	33.7S	29	0027	SC	+ 6	+39	+32	29(1,2)	6	16	133	97	30	10
GN	43.3S	29	0027	SC	+ 2	+22	+22	29(5)	7	33	190	210	30	12
TO	46.7S	29	0025	SC	5	26	5	29(5)	7	59	179	80	30	12
KG	56.5S	29	0357	SC	..	..	..	29(5)	6	--	--	--	30	15
KG	56.5S	29	0027	SC*	..	..	..	29(5)	6	--	--	--	30	15

Reports were received from the following observatories:

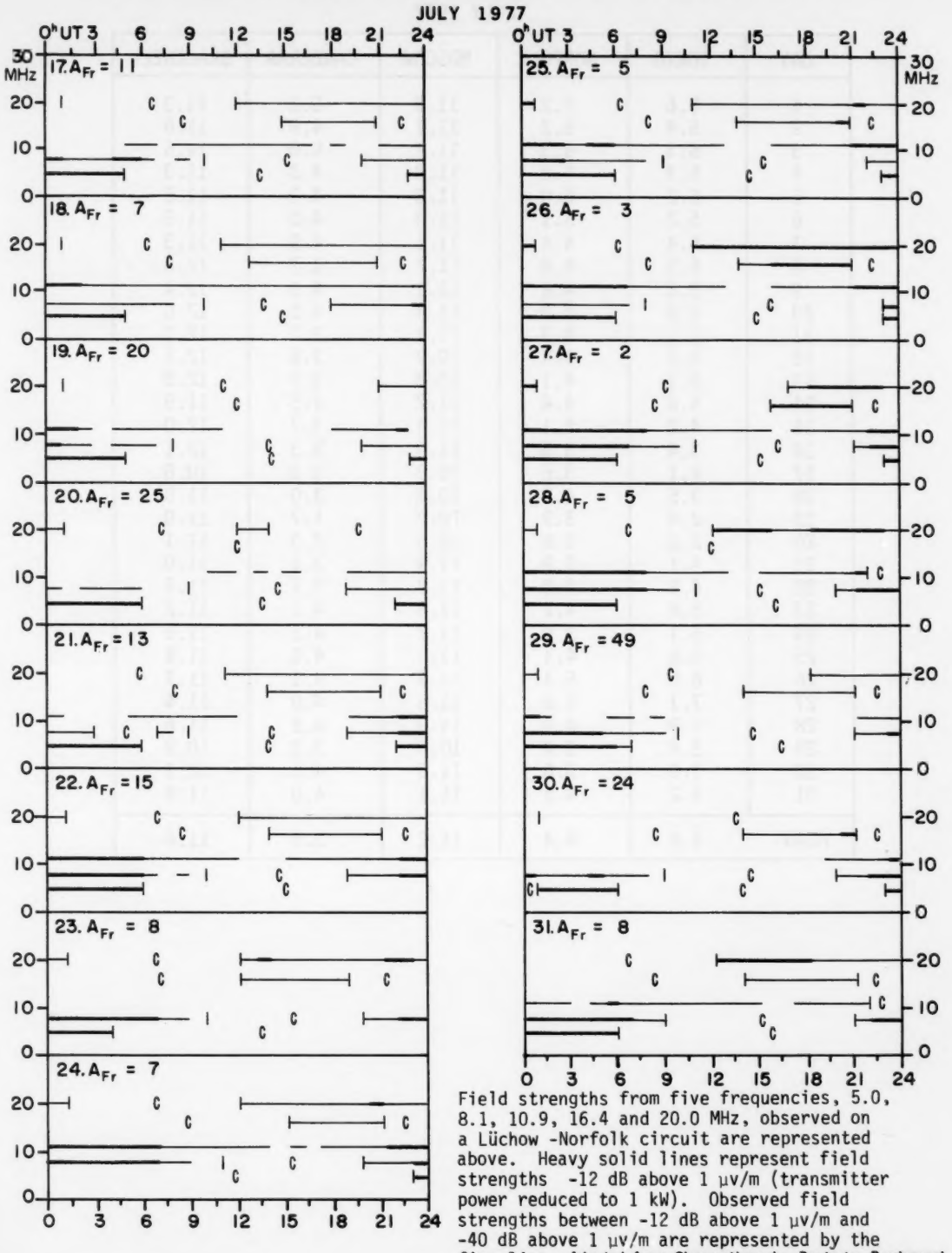
College Witteveen Tucson Jaipur Alibag Annamalaingar Port Moresby Toolangi
Sitka Fredericksburg San Juan Shillong Hyderabad Huancayo Hermanus Port-aux-Francais
Newport Boulder Honolulu Ujjain Guam Trivandrum Gnangara

TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

JULY 1977



TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH



Field strengths from five frequencies, 5.0, 8.1, 10.9, 16.4 and 20.0 MHz, observed on a Lüchow -Norfolk circuit are represented above. Heavy solid lines represent field strengths -12 dB above 1 μv/m (transmitter power reduced to 1 kW). Observed field strengths between -12 dB above 1 μv/m and -40 dB above 1 μv/m are represented by the fine line. Adapted from Observations by Deutsche Bundespost

RADIO PROPAGATION QUALITY INDICES

JULY 1977

DAY	TOKYO	NORFOLK	MOSCOW	CANBERRA	BRACKNELL
1	5.6	5.2	11.0	5.1	11.3
2	5.4	5.2	11.1	4.9	11.6
3	6.3	5.3	11.2	5.0	11.5
4	5.7	4.8	11.3	4.3	11.3
5	6.2	6.0	11.3	4.1	11.6
6	5.2	5.1	11.3	4.0	11.3
7	5.4	4.4	11.1	4.9	11.3
8	6.5	4.8	11.2	4.7	12.4
9	5.5	4.6	11.1	4.0	12.4
10	4.8	4.2	11.4	4.0	12.0
11	5.1	4.3	11.1	3.7	12.1
12	6.0	4.4	10.9	3.6	12.1
13	6.1	4.1	10.8	3.9	12.8
14	5.4	4.4	11.2	4.5	11.9
15	4.0	4.1	11.4	3.7	12.0
16	3.4	3.5	11.0	3.3	12.1
17	4.1	3.6	10.8	3.3	10.8
18	3.5	4.0	10.8	3.0	11.5
19	2.4	3.9	10.8	1.7	11.0
20	2.2	3.8	10.8	2.3	11.1
21	4.1	3.9	11.4	3.1	11.0
22	4.8	4.0	11.2	3.7	11.4
23	5.4	4.2	11.4	4.1	11.2
24	5.1	3.9	11.7	4.2	11.9
25	5.6	4.1	11.6	4.5	11.9
26	6.9	5.4	11.7	4.1	11.7
27	7.1	5.8	11.6	4.0	11.4
28	5.9	4.9	11.3	4.2	11.6
29	2.4	3.4	10.5	3.2	10.9
30	3.0	3.6	11.5	4.5	12.1
31	4.2	4.5	11.1	4.0	11.9
MEAN	4.9	4.4	11.2	3.9	11.6

USCOMM-NOAA-ASHEVILLE, NC-9/77-950

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No397, pt2

September 1977 Number 397-Part II

P-A STACKS

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Solar-Geophysical Data comprehensive reports

Data for March 1977–February 1977 & Miscellanea

Explanation of Data Reports Issued as Number 390 (Supplement) February 1977

ADDENDUM: JUNE 1977 Km, Ks, Kn PAGE 39

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Solar - Geophysical Data

NO. 397 SEPTEMBER 1977

Part II (Comprehensive Reports)

DATA FOR
MARCH 1977
FEBRUARY 1977
& MISCELLANEA

NATIONAL GEOPHYSICAL AND SOLAR - TERRESTRIAL DATA CENTER
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To standardize referencing these reports in the open literature, the following format is recommended:

Solar-Geophysical Data, 390 Part I (or Part II), pages, February 1977, U.S. Department of Commerce, (Boulder, Colorado, U.S.A. 80302).

SOLAR - GEOPHYSICAL DATA

No. 397

Issued in two parts

Helen E. Coffey, Editor

J. Virginia Lincoln, Director
Solar - Terrestrial Data Services Division

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Geomagnetic Indices
Table of Indices Kp, Kn, Ks, Km, Cp, Ap, aa for June 1977

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A.7h	Coronal Line Emission (Sac Peak)						391A 34	392A 28	393A 34	395B 36	395A 36	396A 34	397A 32	
A.8aa	2800 MHz - Daily Values of Solar Flux (ARO-Ottawa)	385A 7	386A 7	387A 7	388A 7	389A 7	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7
A.8ac	2800 MHz - Daily Values of Adj. Solar Flux (ARO-Ottawa)	385A 7	386A 7	387A 7	388A 7	389A 7	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7
A.8g	Daily Values of Adjusted Solar Flux (AFGL)	385A 7	386A 7	387A 7	388A 7	389A 7	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7
A.9cb	8.6 mm Radio Maps of the Sun (MOSC - La Posta)	386A 22	387A 26	388A 26	389A 26	390A 28	391A 34	392A 28	393A 34	394A 32	395A 36	396A 35	397A 32	
A.9d	2 cm Radio Maps of the Sun (MOSC - La Posta)	386A 22	387A 26	388A 26	389A 26	390A 28	391A 34	392A 28	393A 34	394A 32	395A 36	396A 35	397A 32	
A.10a	169 MHz - Interferometric Observations (Nancay)	---	386A 12	387A 12	388A 12	389A 12	390A 12	391A 13	392A 12	393A 13	394A 12	395A 14	396A 12	397A 13
A.10c	21 cm East-West Solar Scans (Fleurs)	385A 14	387A101	388A101	388A 14	389A 14	391B 43	391A 15	393B 35	393A 15	394A 14	395A 16	396A 14	397A 15
A.10d	43 cm East-West Solar Scans (Fleurs)	385A 15	387A102	388A102	388A 15	389A 15	391B 44	391A 16	393B 36	393A 16	394A 15	395A 17	396A 15	397A 16
A.10e	10.7 cm East-West Solar Scans (Ottawa-ARO)	385A 13	386A 13	387A 13	388A 13	389A 13	390A 13	391A 14	392A 13	393A 14	394A 13	395A 15	396A 13	397A 14
A.11g	Solar X-ray (SMS/GOES)	385A 18	386A 16	387A 18	388A 19	389A 18	390A 15	391A 19	392A 15	393A 20	394A 18	395A 21	396A 17	---
A.11h	Solar X-ray (OSO-8; 1975-057A)	386A 22	387A 26	388A 26	389A 26	390A 28	391A 34	392A 28	393A 34	394A 32	395A 36	396A 34	397A 32	
A.11i	Solar X-ray (Columbia U.)		391B 25											
A.12ba	Cosmic Ray Protons (Pioneers 6 & 7)	---	386A 15	387A 16	388A 18	---	---	391A 25	---	393A 24	394A 23	395A 26	396A 24	397A 23
A.12bb	Cosmic Ray Protons (Pioneers 8 & 9)	---	---	387A 17	---	---	---	391A 27	---	393A 26	394A 24	395A 27	396A 25	---
A.12e	Energetic Solar Particles (IMP H & J)	390B 23	391B 20	392B 18	393B 15	394B 17	395B 17	396B 20	397B 15					
A.13a	Solar Wind (Pioneers 6 & 7)	---	386A 15	387A 16	388A 18	---	---	391A 25	---	393A 24	394A 23	395A 26	396A 24	397A 23
A.13ab	Solar Wind (Pioneers 8 & 9)	---	---	387A 17	---	---	---	391A 27	---	393A 26	394A 24	395A 27	396A 25	---
A.13d	Solar Wind from IPS Measurements			387A 15	388A 17	389A 17	390A 24	391A 24	392A 23	393A 27	394A 25	395A 31	396A 27	397A 27
A.13e	Solar Plasma (IMP H & J)	390B 22	391B 19	392B 19	393B 15	394B 17	395B 17	396B 19	397B 15					
A.17	Interplanetary Magnetic Field (Pioneer 8)	---	---	---	---	---	---	---	---	---	---	395A 27	396A 25	---
A.17	Interplanetary Magnetic Field (Pioneer 9)	---	---	387A 17	---	---	---	391A 27	---	393A 26	394A 24	---	396A 26	---
A.17c	Inferred IP Magnetic Field	385A 22	386A 18	387A 21	388A 22	389A 22	390A 20	391A 28	392A 20	393A 28	394A 26	---	396A 28	397A 24
A.18	Interplanetary Electric Field (Pioneer 8)	---	---	---	---	---	---	---	---	---	---	395A 27	396A 25	---
A.18	Interplanetary Electric Field (Pioneer 9)	---	---	387A 17	---	---	---	391A 27	---	393A 28	394A 24	---	396A 26	---
B.	Ionospheric (and Radio Wave Propagation) Phenomena													
B.52	Graphs of Transmission Frequency Range	386A112	387A116	388A116	389A110	390A116	391A118	392A104	393A122	394A118	395A122	396A118	397A120	
B.53	Quality Figures Based on Frequency Ranges	386A114	387A118	388A118	389A109	390A118	391A120	392A103	393A121	394A120	395A124	396A120	397A122	
C.	Flare-Associated Events													
C.1a	Optical Observations Flares	385A 10	386A 10	387A 10	388A 10	389A 10	390A 10	391A 11	392A 10	393A 10	394A 10	395A 10	396A 10	397A 10
C.1ba	Optical Observations Flares (Standardized Data)	390B 6	391B 8	392B 8	393B 8	394B 8	395B 8	396B 8	397B 8					
C.1d	Flare Patrol Observations	385A 11	386A 11	387A 11	388A 11	389A 11	390A 11	391A 12	392A 11	393A 12	394A 11	395A 13	396A 11	397A 12
C.1d	Flare Patrol Observations	390B 11	391B 13	392B 13	393B 12	394B 13	395B 13	396B 13	397B 11					
C.1e	Flare Indices (by day)	390B 10	391B 12	392B 12	393B 11	394B 12	395B 12	396B 12	397B 10					
C.1f	Flare Indices (by Region)	391B 39	392B 36	393B 31	394B 33	395B 33	396B 35	397B 31						
C.3	Solar Radio Waves - Outstanding Occurrences	390B 12	391B 14	392B 14	393B 13	394B 14	395B 14	396B 14	397B 12					
	Solar Radio Waves - Fixed Frequencies - Selected	385A 16	386A 14	387A 14	388A 16	389A 16	390A 14	391A 17	392A 14	393A 17	394A 16	395A 18	396A 16	397A 17
C.3t	43.25, 80 and 160 MHz Selected Bursts (Culgoora)	390B 42	390B 43	390B 44	391B 45	391B 46	393B 40	393B 41	393A108	394A105	396B 41			
C.4a	Solar Radio Spectral Obs. (Fort Davis)	356A 91	387A 95	388A 96	389A 92	390A 97	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103	
C.4b	Solar Radio Spectral Obs. (Boulder)	---	---	---	---	---	---	---	---	---	---	---	---	
C.4d	Solar Radio Spectral Obs. (Culgoora)	387B 32	389B 29	389B 32	389A 92	391B 47	391A103	393B 37	393A102	394A 98	396B 38	397B 34	397A103	
C.4e	Solar Radio Spectral Obs. (Weissenau)	386A 91	387A 95	388A 96	389A 92	390A 97	391A103	392A 90	393A102	394A 98	395A106	397B 34	397A103	
C.4f	Solar Radio Spectral Obs. (Sagamore Hill)	386A 91	387A 95	388A 96	389A 92	390A 97	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103	
C.4h	Solar Radio Spectral Obs. (Dwingeloo)	386A 91	387A 95	388A 96	389A 92	390A 97	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103	
C.4i	Solar Radio Spectral Obs. (Dürnten)	386A 91	387A 95	388A 96	389A 92	390A 97	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103	
C.4j	Solar Radio Spectral Obs. (Manila)	386A 91	387A 95	388A 96	389A 92	390A 97	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103	
C.5e	Solar X-ray (SMS/GOES)	385A 20	---	---	---	389A 20	390A 17	391A 21	392A 17	393A 22	394A 20	395A 21	396A 17	397A 22
C.5f	Solar X-ray (Columbia U.)													
C.6	Sudden Ionospheric Disturbances	386A 90	387A 94	388A 95	389A 91	390A 96	391A102	392A 89	393A101	394A 97	395A105	396A100	397A102	
D.	Geomagnetic and Magnetospheric Phenomena													
D.1a	Geomagnetic Indices Kp, Kn, Ks, Km, Ap, aa, Cp	386A104	387A108	388A108	389A102	390A107	391A114	392A 97	393A114	394A111	395A115	397B 39	397A114	
D.1ba	27-day Chart of Kp Indices	386A106	387A110	388A110	389A104	390A109	391A116	392A 99	393A116	394A113	395A117	396A113	397A116	
D.1c	27-day Chart of C9	390A110	390A110	390A110	390A110	390A110								
D.1d	Principal Magnetic Storms	386A109	387A113	388A113	389A107	390A114	391A117	392A101	393A119	394A116	395A120	396A116	397A119	
D.1e	Reduced Magnetograms	---				---				---	---			
D.1f	Sudden Commencement and Solar Flare Effects	386A110	387A114	388A114	389A108	390A115	392B 38	392A102	393A120	394A117	395A121	396A117		
D.1g	Equatorial Indices Dst	386A108	387A112	388A112	389A106	390A113		392A100	393A118	394A115	395A119	396A115	397A118	
F.	Cosmic Rays													
F.1a	Cosmic Ray Neutron Counts (Deep River)	386A 99	387A103	388A103	389A 97	390A106	391A109	393B 44	393A109	394A110	395A114	396A110	397A109	
F.1b	Cosmic Ray Neutron Counts (Climax)	386A 99	387A103	388A103	389A 97	390A106	391A109	392A 96	393A109	394A110	395A114	396A110	397A109	
F.1e	Cosmic Ray Neutron Counts (Alert)	386A 99	387A103	388A103	389A 97	390A106	391A109	393B 44	393A109	394A110	395A114	396A110	397A109	
F.1f	Cosmic Ray Neutron Counts (Calgary)	386A 99	387A103	388A103	389A 97	390A106	393B 44	394B 36	394B 36	394A110	395A114	396A110	397A109	
F.1g	Cosmic Ray Neutron Counts (Sulphur Mountain)	386A 99	387A103	388A103	389A 97	390A106	393B 44	394B 36	394B 36	394A110	395A114	396A110	397A109	
F.1h	Cosmic Ray Neutron Counts (Thule)	---	---	---	---									
F.1i	Cosmic Ray Neutron Counts (Kiel)	386A 99	387A103	388A103	389A 97	390A106	391A109	392A 96	393A109	394A110	395A114	396A110	397A109	
F.1j	Cosmic Ray Neutron Counts (Tokyo)	386A 99	387A103	388A103	389A 97	390A106	391A109	392A 96	393A109	394A110	395A114	396A110	397A109	
F.1k	Cosmic Ray Neutron Counts (Kula)										395A114	396A110	397A109	
H.	Miscellaneous													
H.60	IUWDS Alert Decisions	385A 5	386A 5	387A 4	388A 5	389A 4	390A 4	391A 5	392A 5	393A 5	394A 5	395A 4	396A 5	397A 4
H.62	Abbreviated Calendar Record	391B 32	392B 28	393B 24	394B 26	395B 26	396B 28	397B 24						

Note: A = Part I, B = Part II.

386A 22 listed under 1976 Aug shows that data for August 1976 were contained in *Solar-Geophysical Data* Number 386 - Part I beginning on page 22.

MARCH 1977 DATA

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ACTIVE REGION

CARRINGTON ROTATION 1652

(February 24 - March 23, 1977)

Region No.	Coordinates		Age at CMP	IMP.	Spot-less Region	Region No. in Rotation 1651	Activity at West Limb
	Lat.	Long.					
1	24°N	347°	0	1	x		disappeared
2	5 S	318	-3	1	x		disappeared
3	25 N	265	0	1	x		disappeared
4	26 N	255	>6	1	x	(2)	stable
5	16 N	210	>6	1	x		dispersed
6	17 N	200	>6	2			decreasing
7	22 N	200	0	2			decreasing
8	5 N	150	+3	1	x		disappeared
9	24 N	143	>6	1	x	(11)	decreasing
10	43 S	129	>6	1	x	(8)	decreasing
11	32 S	108	+6	1	x		disappeared
12	19 S	92	-1	1	x		disappeared
13	20 S	56	>6	1	x		
14	29 S	50	-3	2			
15	17 N	47	+2	1	x		disappeared
16	25 N	46	-2	1	x		stable

ACTIVE REGIONS

CARRINGTON ROTATION 1653

(March 23 - April 20, 1977)

Region No.	Coordinates		Age at CMP	IMP.	Spot-less Region	Region No. in Rotation 1652	Activity at West Limb
	Lat.	Long.					
1	43°S	334°	-3	1	x		disappeared
2	21 N	312	0	1	x		decreasing
3	17 S	305	>6	1	x		disappeared
4	15 N	263	+3	1	x		disappeared
5	26 N	258	>6	1	x		decreasing
6	29 N	250	>6	1	x	(4)	decreasing
7	19 N	244	-4	1	x		stable
8	35 N	150	0	1	x		disappeared
9	26 N	143	-4	1	x		decreasing
10	32 N	138	>6	1	x		dispersed
11	0	134	>6	1	x		dispersed
12	25 S	73	-5	1	x		stable
13	25 S	60	0	2			decreasing
14	26 N	50	0	1	x		disappeared
15	25 N	46	-1	1	x		disappeared
16	20 S	27	>6	4			decreasing
17	22 S	16	>6	1	x		decreasing

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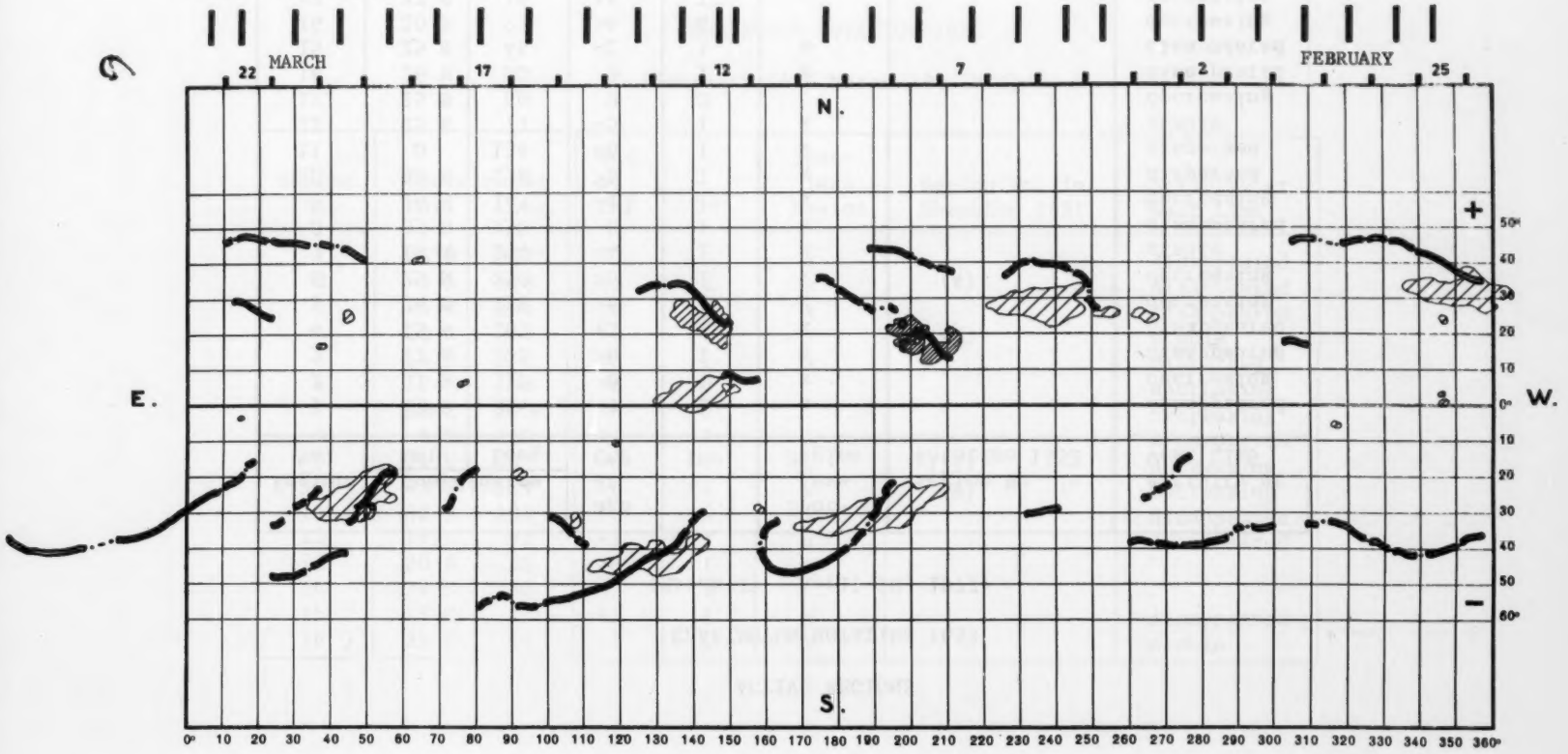
SYNOPTIC SOLAR MAP

CARRINGTON ROTATION 1652

FEBRUARY 24 - MARCH 23, 1977

MEUDON OBSERVATORY

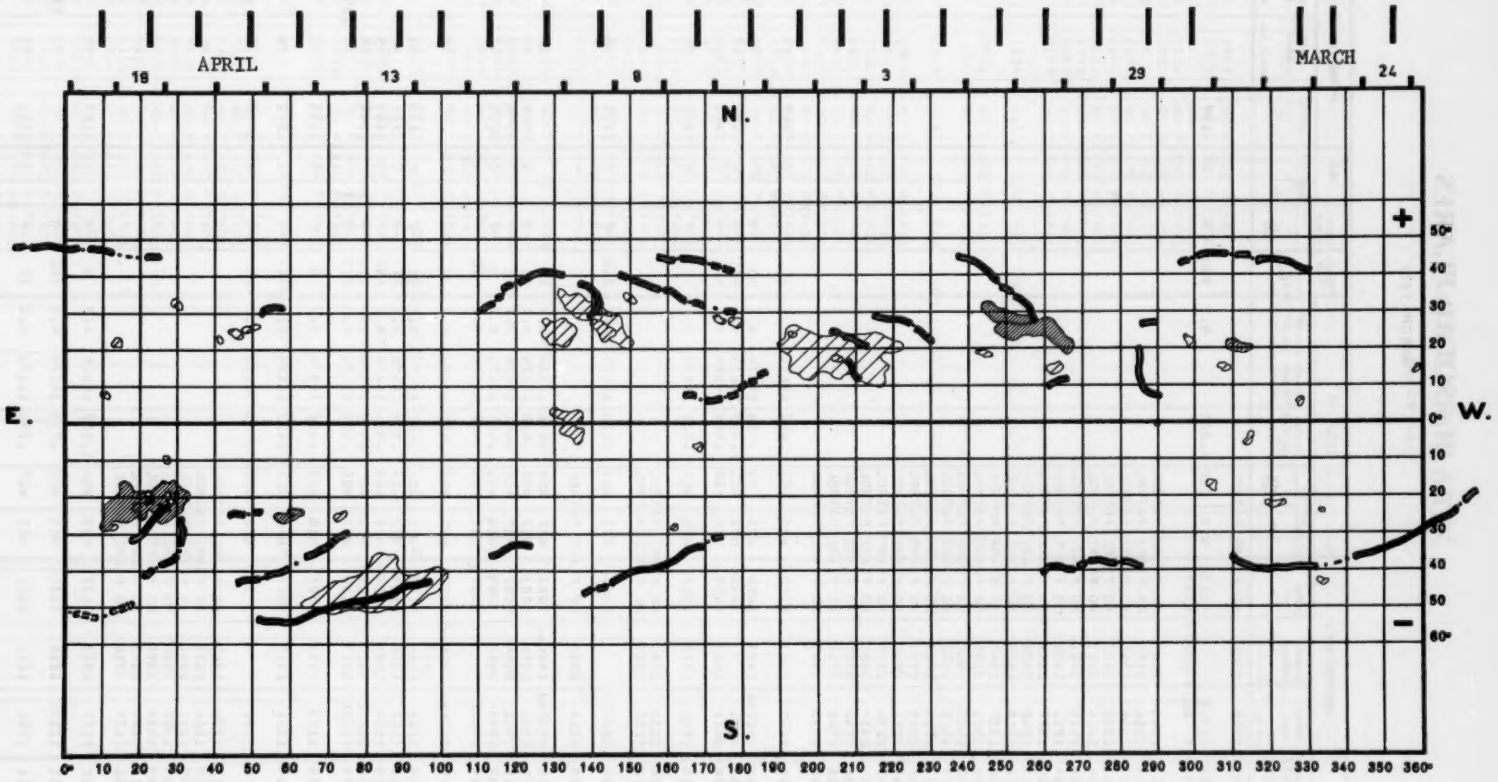


SYNOPTIC SOLAR MAP

CARRINGTON ROTATION 1653

MARCH 23 TO APRIL 20, 1977

MEUDON OBSERVATORY



7 Mar 77

Hα SOLAR FLARES

MARCH 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS	
					APPROX		CENTRAL DISTANCE	McMATH PLAGE REGION	CMP DAY			CONG	TYPE	TIME	MEAS. AREA	CORR AREA		
	DATE 1977 MAR	START	MAX. PHASE	END	LAT.	MER. DIST.				MIN.				UT	Mill. of Disk	Sq. Deg.		
	01	0240	0314	NO FLARE PATROL														
825 KHAR	02	1034E		11130	N10	E90	1.000		9.2	390	? N		P	1037				Y5
	IMP+1	NO	HTPR2	HONT2														
	02	2049	2148	NO FLARE PATROL														
	03	2116	2123	NO FLARE PATROL														
	03	2144	2345	NO FLARE PATROL														
	03	2358	0002	NO FLARE PATROL														
	04	0004	0019	NO FLARE PATROL														
	04	1616	1801	NO FLARE PATROL														
	04	1822	1835	NO FLARE PATROL														
	04	1927	2119	NO FLARE PATROL														
	04	2240	2330	NO FLARE PATROL														
	06	1819	1825	NO FLARE PATROL														
	06	1837	1840	NO FLARE PATROL														
	06	1901	2250	NO FLARE PATROL														
	07	0410	0416	NO FLARE PATROL														
	07	1620	1652	NO FLARE PATROL														
	07	1713	1725	NO FLARE PATROL														
	07	2005	2007	NO FLARE PATROL														
	07	2011	2042	NO FLARE PATROL														
	07	2254	2315	NO FLARE PATROL														
	08	0335	0450	NO FLARE PATROL														
	08	0544	0700	NO FLARE PATROL														
	08	0740	0746	NO FLARE PATROL														
	08	0943	0945	NO FLARE PATROL														
826 HTPR	08	1040	1047	1102	N20	E03	.460	14674	8.7	22	-F		C	1047	20	.2	E	Y5
GRP63827	08	1405+6	1423	1458	N20	00	.458	14674	8.6	53	-N				90	1.0	E	
HTPR	08	1405		14460	N20	E01	.458	14674	8.7	410	-N		C	1421	60	.6	E	
MCMA	08	1411	1423	1458	N20	E00	.458	14674	8.6	47	-B		C	1423	120	1.4	E	
828 MCMA	08	1852	1853	1857	N21	W14	.521	14674	7.7	5	-F		C	1853	25	.3	EH	Y5
	08	2030	2040	NO FLARE PATROL														
	08	2152	2227	NO FLARE PATROL														
829 CULG	08	2236U		2300	N21	W03	.476	14674	8.7	240	-F		C	2236	30	.3		Y5
	09	0210	0307	NO FLARE PATROL														
GRP63830	09	0952+2	0954+1	1003	N17	W09	.436	14674	8.7	11	-F				40	.4	E	
LOCA	09	0952	0954	1003	N17	W08	.430	14674	8.8	11	-N		V	0954	61	.7		
HTPR	09	0952	0954	1002	N17	W10	.441	14674	8.7	10	-F		C	0954	20	.2	E	
MEUD	09	0954	0955	0959	N16	W09	.421	14674	8.7	5	-F		C	0955	40	.4	E	
KHAR	09	0958E		10050	N17	W08	.430	14674	8.8	70	-F		C				4	
GRP63831	09	1101+3	1106+3 1117	1133	N21	W08	.490	14674	8.9	32	-F				50	.6		
ZURI	09	1101	1109	1133	N21	W06	.482	14674	9.0	32	-F		C	1109	50	.6		
HTPR	09	1102	1106	1129	N22	W09	.508	14574	8.8	27	-N		C	1106	40	.4		
MEUD	09	1104	1108	11230	N22	W08	.504	14674	8.9	190	-F		C	1108	40	.4		
CATA	09	1110E	1110	11250	N21	W07	.486	14674	8.9	150	-F	2		1110	56	.7		
ATHN	09	1112E	1117	1134	N20	W08	.475	14674	8.9	220	-N	1			66	134.0		
832 HTPR	09	1153	1158	1202	N16	W10	.427	14674	8.7	9	-F		C	1158	20	.2	E	Y5
833 HTPR	09	1311	1312	1317	N16	W11	.433	14674	8.7	6	-F		C	1312	20	.2	E	Y5
834 MCMA	09	1707		1728	N22	W14	.534	14674	8.7	21	-B		C	1707	130	1.6	E	Y5
	09	1754	1812	NO FLARE PATROL														
	09	1824	1826	NO FLARE PATROL														
	09	1831	1842	NO FLARE PATROL														
	09	1907	1924	NO FLARE PATROL														
	09	1936	2300	NO FLARE PATROL														
	10	2007	2013	NO FLARE PATROL														
	10	2135	2210	NO FLARE PATROL														
835 HITK	11	0127	0127	0130	N28	W90	1.002	14566	4.3	3	-N		C	0127	50		D	Y5
836 ATHN	11	1215E	1216	12310	N21	W36	.710	14674	8.8	160	-N	1			33	80.0		Y5
837 MCMA	11	1750	1802	1822	N22	W37	.726	14674	9.0	32	-F		C	1802	60	.9	E	Y5

Hα SOLAR FLARES

MARCH 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS		MEASUREMENTS			REMARKS	
	DATE 1977 MAR	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		COND	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
	11	2036	2046	NO FLARE PATROL														
	11	2109	2215	NO FLARE PATROL														
	12	0040	0122	NO FLARE PATROL														
	12	0126	0140	NO FLARE PATROL														
	12	0259	0300	NO FLARE PATROL														
	12	1816	2005	NO FLARE PATROL														
	12	2014	2033	NO FLARE PATROL														
	12	2136	2143	NO FLARE PATROL														
	13	0945	1035	NO FLARE PATROL														
	13	1741	1919	NO FLARE PATROL														
	13	1922	2049	NO FLARE PATROL														
	13	2127	2148	NO FLARE PATROL														
838 HTPR	14	1130	1134	1140	S20	E68	.920	14686	19.6	10	-F		C	1134	30	.5	E	Y5
	14	1908	1920	NO FLARE PATROL														
	14	2241	2245	NO FLARE PATROL														
839 CULG	14	2337	2344	0017	S22	E60	.862	14686	19.5	40	-F		C	2355	40	.8		Y5
	16	1953	1958	NO FLARE PATROL														
	16	2033	2043	NO FLARE PATROL														
	16	2110	2120	NO FLARE PATROL														
	17	0407	0416	NO FLARE PATROL														
	17	1430	1440	NO FLARE PATROL														
	17	1445	1449	NO FLARE PATROL														
	17	1456	1500	NO FLARE PATROL														
	17	1602	1623	NO FLARE PATROL														
	17	1737	1753	NO FLARE PATROL														
	17	1757	1829	NO FLARE PATROL														
	17	2002	2055	NO FLARE PATROL														
	18	1555	1624	NO FLARE PATROL														
	18	1730	1745	NO FLARE PATROL														
	18	1750	1937	NO FLARE PATROL														
	18	2031	2045	NO FLARE PATROL														
	18	2100	2111	NO FLARE PATROL														
	18	2222	2232	NO FLARE PATROL														
	19	0416	0424	NO FLARE PATROL														
	19	0428	0442	NO FLARE PATROL														
	20	0735	0740	NO FLARE PATROL														
	20	2019	2105	NO FLARE PATROL														
840 ATHN	21	0903E	0935	1015D	S18	E90	.999	14696	28.1	72D	-N	1						Y5
	21	1610	1619	NO FLARE PATROL														
	21	1830	1955	NO FLARE PATROL														
	22	1643	1649	NO FLARE PATROL														
	23	1505	1515	NO FLARE PATROL														
	23	1604	1817	NO FLARE PATROL														
841 HTPR	24	0713	0716	0720	N26	W53	.875	14698	20.3	7	-F		C	0716	30	.5	E	Y5
	24	2322	2333	NO FLARE PATROL														
	25	0052	0100	NO FLARE PATROL														
	25	0520	0521	NO FLARE PATROL														
	25	0525	0536	NO FLARE PATROL														
	25	0550	0556	NO FLARE PATROL														
842 KHAR	26	1120E		1130D	N24	W90	1.001	14698	19.7	10D	-F	*	P					Y5
	26	2151	2152	NO FLARE PATROL														
	27	1600	1618	NO FLARE PATROL														
	27	1647	1705	NO FLARE PATROL														
	27	1851	2027	NO FLARE PATROL														
	28	1435	1730	NO FLARE PATROL														
	29	0501	0506	NO FLARE PATROL														
	29	0522	0528	NO FLARE PATROL														
	29	0945	1000	NO FLARE PATROL														
	29	1045	1118	NO FLARE PATROL														
	29	1137	1216	NO FLARE PATROL														
	30	0507	0525	NO FLARE PATROL														
	30	0541	0547	NO FLARE PATROL														
	30	0550	0620	NO FLARE PATROL														
	30	0623	0644	NO FLARE PATROL														
	30	0648	0650	NO FLARE PATROL														
	30	0725	0750	NO FLARE PATROL														
	30	0824	0835	NO FLARE PATROL														

Hα SOLAR FLARES

MARCH 1977

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE 1977 MAR	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		CONG	TYPE	TIME UT	MEAS. AREA Mil. of Disk	CORR AREA Sq. Deg.	
	30	1728	1737	NO FLARE PATROL													
	30	2007	2016	NO FLARE PATROL													
	30	2038	2225	NO FLARE PATROL													
	31	0938	0951	NO FLARE PATROL													
	31	1147	1201	NO FLARE PATROL													
	31	1318	1325	NO FLARE PATROL													
	31	1330	1342	NO FLARE PATROL													
	31	1731	1748	NO FLARE PATROL													

"Remarks":

A = Eruptive prominence whose base is less than 90° from central meridian.
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No visible spots in the neighborhood.
H = Flare accompanied by a high speed dark filament.
I = Active region very extended.
J = Distinct variations of plage intensity before or after the flare.
K = Several intensity maxima.
L = Existing filaments show signs of sudden activity.
M = White-light flare.
N = Continuous spectrum shows effects of polarization.
O = Observations have been made in the calcium II lines H and K.
P = Flare shows helium D_3 in emission.
Q = Flare shows the Balmer continuum in emission.
R = Marked asymmetry in Hα line suggests ejection of high velocity material.
S = Brightness follows disappearance of filament (same position).
T = Region active all day.
U = Two bright branches, parallel (||) or converging (Y).
V = Occurrence of an explosive phase: important and abrupt expansion in about a minute with or without important intensity increase.
W = Great increase in area after time of maximum intensity.
X = Unusually wide Hα line.
Y = System of loop-type prominences.
Z = Major sunspot umbra covered by flare.

MARCH 1977

DAILY FLARE INDICES
Includes all Flares

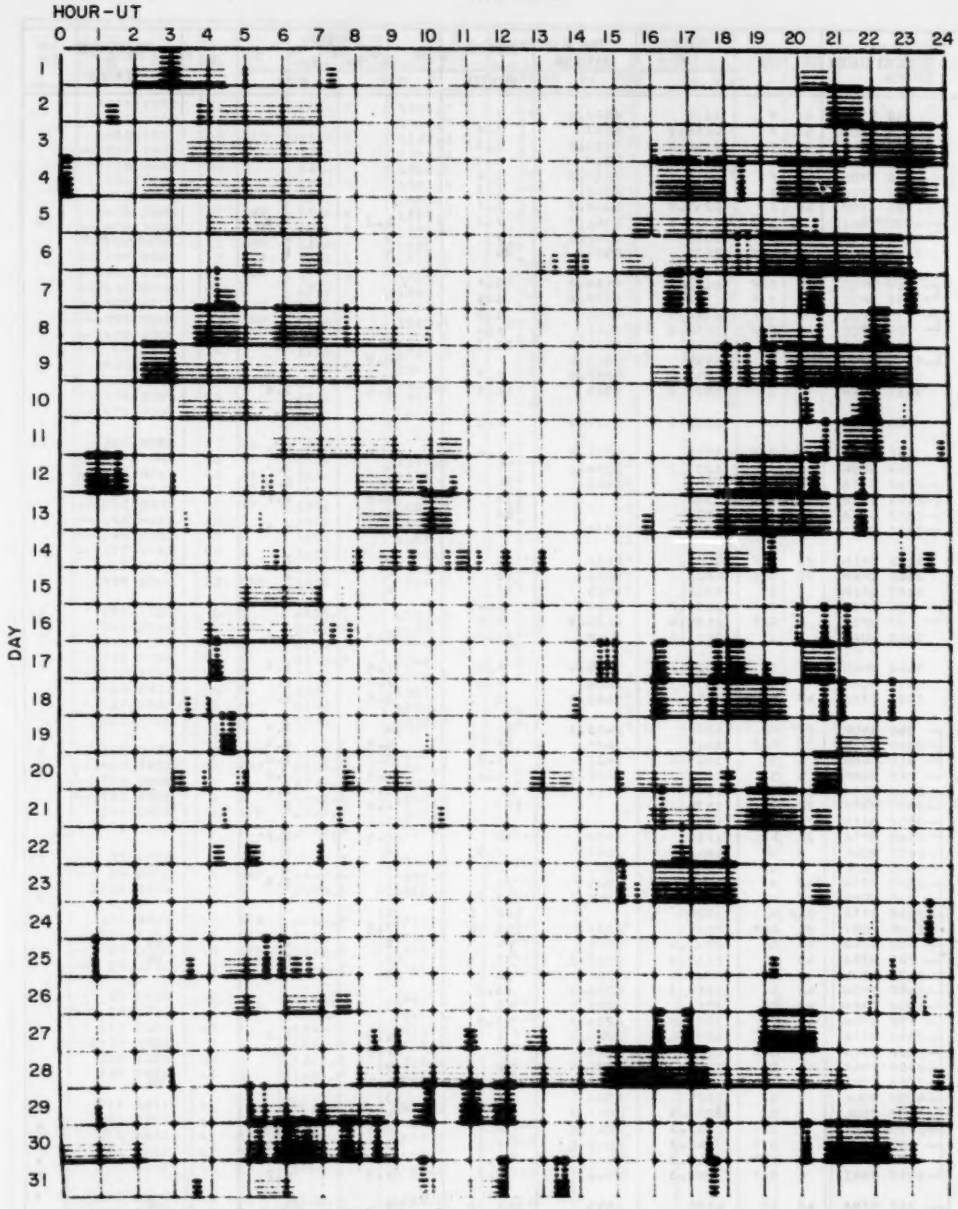
Date	Flare Index	HR. OBS.	Date	Flare Index	HR. OBS.	Date	Flare Index	HR. OBS.
770301	0.00	23.4	770311	4.81	22.7	770321	.85	22.4
770302	0.00	23.0	770312	0.00	20.8	770322	0.00	23.9
770303	0.00	21.8	770313	0.00	19.7	770323	0.00	21.6
770304	0.00	19.0	770314	1.69	23.7	770324	.85	23.8
770305	0.00	24.0	770315	0.00	24.0	770325	0.00	23.6
770306	0.00	20.0	770316	0.00	23.6	770326	.84	24.0
770307	0.00	22.3	770317	0.00	21.5	770327	0.00	21.8
770308	14.87	20.6	770318	0.00	20.9	770328	0.00	21.1
770309	19.66	18.9	770319	0.00	23.6	770329	0.00	22.4
770310	0.00	23.3	770320	0.00	23.2	770330	0.00	20.0
						770331	0.00	23.0

When no Flare Index is given, it is 0 for that day.

INTERVALS OF NO FLARE PATROL OBSERVATION

FOR PRECEDING SOLAR FLARE TABLE

MARCH 1977



Observatories included in total patrol:

Athenes	Herstmonceux	Kiev	McMath-Hulbert	Tashkent
Bucharest	Huancayo	Kodaikanal	Meudon	Tehran
Catania	Hurbanovo	Locarno	Mitaka	Upice
Culgoora	Istanboul	Lvov	Monte Mario	Voroshilov
Haute Provence	Kharkov	Manila	Palehua	Wendelstein
			Ramey	Zürich

Times of no flare patrol are shown by the shaded area for each day divided into times of no cinematographic patrol (bottom half of day) and times of neither visual nor cinematographic patrol (top half of day).

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

MARCH 1977

MAR 1977	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
2	700	SYDN 40 F		0028	0028.8	1				
	700	SYDN 40 F		0055.5	0057	1.8				
	700	SYDN 40 F		0104.5	0105.2	1.3				
	700	SYDN 40 F		0226.2	0227	0.9				
	700	SYDN 40 F		0234.3	0235.3	1.4				
	700	SYDN 40 F		0242.2	0242.4	0.3				
	700	SYDN 40 F		0244.5	0245.7	1.7				
	4995	MANI 2 S/F		0337.5	0341.3	7.3	6.3	3.2		1
	3750	TYKW 45 C		0338	0341.3	7	6	2		OL.112078F
	3100	CRIM 20 GRF		0932	0940	30	4	1		
3	29	UPIC 4 S/F		1137.4	1138.2	0.7				
	33	UPIC 4 S/F		1137.4	1137.8	1.1				
	33	UPIC 4 S/F		1140.5	1141	1.9				
	29	UPIC 4 S/F		1140.8	1141	1.6				
	9400	HUAN S		1500	1503.5	21.3	23.5	4.7		
	9400	HUAN S		1500	1512.4		16.8			
	9400	HUAN S		1553.3	1557.5	6.7	84	2.6		
	9400	HUAN S		1909.4	1949	64.5	8.4	3.8		
4	260	ONDR 8 S		1135.8	1135.8	0.2	35			
5	260	ONDR 2 S/F		1214	1214.8	1.5	4	0.5		
	260	ONDR 3 S		1253.2	1254.2	2	6	2.4		
	2800	OTTA 24 R		1840	1900	20	0.8	0.4		
	2800	OTTA 27 RF		1840		110	0.8	0.7		
	2800	OTTA 24P R		1900		80	0.8			
	2800	OTTA 26 FAL		2020	2030	10	-0.8	-0.4		
6	3100	CRIM 20 GRF		0606	0636	54	5	2		
	3100	CRIM 20 GRF		0822	0850	52	5	2		
	3100	CRIM 1 S		0915	0920	10	4	1		
	29	UPIC 4 S/F		1138.7	1139	1.4				
	33	UPIC 4 S/F		1139.6	1139.9	0.6				
	9400	HUAN S		2217.5	2240	28.7	15.2	8.1		
7	9400	HUAN S		1325.2	1329.4	6.4	7.9	1.8		
	9400	HUAN S		1338.2	1339	7.8	7.9	2.7		
	1000	TYKW 45 C		2359	2402.9	6	1.5	0.4		
8	260	ONDR 27 RF		1340	1433.3	86	10	3.5		
	2800	OTTA 20 GRF		1415	1435	55	1.8	0.9		
	410	SGMR 6 S		1419.6	1422	8.3	5.2	1.6		1
	245	SGMR 6 S		1421.1	1422.3	6.1	2.9	.9		1
	2800	OTTA 24 R		1535	1602	27	1.4	0.8		
	2800	OTTA 27 RF		1535		195	1.4	1		
	2800	OTTA 24P R		1602		73	1.4			
	2800	OTTA 26 FAL		1715	1850	95	-1.4	-0.7		
	2695	BOUL 2 SF		1842.5	1843	2.5	6	2		
	4995	BOUL 1 S		1849	1850	2	8	3		
	2800	OTTA 240 R		1905	1925	20	1	0.5		
	245	SGMR 43 NS		1924.1	1940.2	113.9	11			2
	2800	OTTA 24P R		1925		150 D	1			
	2695	PENT 21 GRF		2150	2234	150 D	7.2			
	500	HIRA 45 C		2212.5	2221	24	10	4		HR
	200	HIRA 45 C		2213.5	2222.3	25	45	10		HR
	1420	BOUL 45 C		2219.5	2227	16	23	9		
	1400	SYDN 45 C		2219.8	2226.9	13.2				
	1000	TYKW 45 C		2219	2225.8	15	29	4 U		
	700	SYDN 40 F		2220.5	2226.1	12.5				
	2800	OTTA 1 S		2220.6	2220.9	1	1.6	0.8		
	2800	OTTA 4 S/F		2224	2226.5	9	17.2	4.9		
	2000	TYKW 45 C		2224	2226.5	12	19	6		
	3750	TYKW 45 C		2225	2226.2	15	11	3		OL
	4995	BOUL 2 SF		2225	2226	5	13	4		
	2695	BOUL 3 S		2226.5	2227.5	10	14	5		
	2695	MANI 2 S/F		2243.3	2245.2	3.7	2.6	.9		1
	606	MANI 2 S/F		2243.3	2245.6	7.2	5.3	2.1		1
	4995	MANI 2 S/F		2243.3	2245.6	3.7	6.3	3.1		1
	8800	MANI 4 S/F		2243.3	2246	3.7	18.3	9.2		1
9	200	HIRA 43 NS		0120	0555	440 D	55	28		HR
	221	ABST 44 NS		0500	0610.8	240	12			
	127	TORN 44 NS		0730 E	1150 U	380 D				V=0
	260	ONDR 44 NS		0815 E		415 D	40	9		
	245	SGMR 43 NS		1132.2	1312.3	666.8D	59.8			SWF 1
	9400	TYKW 20 GRF		0500	0515	60	5	2		
	2000	TYKW 21 GRF		0500	0513	40	3.5	1.4		OR
	3750	TYKW 20 GRF		0502	0513	60	2	1		OL
	1400	SYDN 45 C		0503	0505.2	7				
	1000	TYKW 45 C		0503	0505.4	13	25	4		
	2000	TYKW 45 C		0503	0506.3	6	4	0.5		45R
	700	SYDN 45 C		0505.2	0506	2.3				
	1400	SYDN 2 S		0511	0511.1	4.5				

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

MARCH 1977

MAR 1977	FREQUENCY	STATION	TYPE		STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} MEAN	INT	POLARIZATION OR REMARKS
	237	TRST	41	F	0854.7	0854.7	0.1	230			O
	127	TORN	45	C	1107.2	1112.7	8	60			
	408	TRST	42	SER	1118.5	1122.3	8	66			
	237	TRST	41	F	1311.7	1312.3	0.7	94			4R
	228	HARS	45	C	1312	1312.5	1.5	180	40		
	536	ONDR	1	S	1321.5	1321.5	0.2	10			
	930	BORD	46	C	1553	1555.2	4	8	2		
	1415	SGMR	22	GRF	1704.5	1709.7	13.5U	34.5	21 U		SWF 2
	606	SGMR	22	GRF	1704.8	1707.7	10.2U	4.6	2.7U		SWF 2
	2800	OTTA	21	GRF	1704	1725	205	3	1.5		
	2695	SGMR	2	S/F	1705.1	1707.2	9.9U	6.3	3.8U		SWF 2
	8800	SGMR	22	GRF	1705.8	1710	24.2U	8.3	5 U		SWF 2
	2695	BOUL	45	C	1705	1708	7.5	5	2		
	2800	OTTA	2	S/F	1705	1707	5.5	5	1.7		
	4995	SGMR	22	GRF	1706.2	1709.1	23.8U	4.6	2.8U		SWF 2
	1420	BOUL	45	C	1706	1709.5	6.5	3	1		
	245	SGMR	6	S	1725	1725.3	1.2	17.5	9		3
	4995	BOUL	45	C	1842.5	1845	2.5	15	5		
	2800	OTTA	2	S/F	1915.8	1916.5	2	1	0.5		
	4995	BOUL	45	C	1916	1917	3.5	17	6		
	1420	BOUL	45	C	1916	1917.5	2	4	1		
10	207	WORO	43	NS	0000		60		8		
	127	TORN	43	NS	0907 U	1133.5	290 U	18			V=1
	160	HARS	43	NS	1104	1140	166	20	13		
	240	HARS	43	NS	1104	1130	96	10	8		
	260	ONDR	27	RF	1050	1102.3	90	12	2.8		
	160	HARS	45	C	1101	1103	3	55	10		
	240	HARS	45	C	1101	1102	3	20	5		
	127	TORN	45	C	1102.1	1102.6	1.5	60	15		
	237	TRST	41	F	1102.2	1102.4	0.4	55			O
	1420	BOUL	23	GRF	1526	1527.5	10	2	1		
11	700	SYDN	8	S	0101.8	0101.9	0.2				
	700	SYDN	4	S	0122.9	0123.2	0.5				
	500	HIRA	45	C	0244	0246.3	4	30	5		O
	700	SYDN	45	C	0245.2	0246	2.7				
	1000	TYKW	45	C	0245	0246.9	5	3.8	1.2		
	3100	CRIM	24	R	0807	0917		2			
	127	TORN	40	F	1148	1200.6	16 U	10			
	9400	HUAN		S	1854	1932.7	48.2	9.1	3.3		
12	260	ONDR	2	S/F	1122.8	1122.8	1	9			
	1420	ARCE	22	GRF	1223.7	1241.3	56				
	260	ONDR	1	S	1235.8	1235.8	0.2	6			
	9100	ARCE	1	S	1247.1	1247.3	0.7				RECORDDISTURBED
	260	ONDR	4	S/F	1327.7	1328.3	2.5	37	19		
	9400	HUAN		S	2222.3	2230.8	16.8	14.3	6.7		
13	33	UPIC	4	S/F	0842.1	0842.2	0.7				
	29	UPIC	4	S/F	0842.4	0842.5	0.5				
	2800	OTTA	1	S	1909.5	1910.2	1.2	0.8	0.4		
14	221	ABST	42	SER	0745.5	0745.8	0.5	18			
	221	ABST	42	SER	0804	0804.2	0.5	28			
	33	UPIC	4	S/F	1340.6	1340.7	1.5				
	29	UPIC	8	S	1340.6	1341.2	1.2				
15	33	UPIC	45	C	0641.7	0642.1	0.5				
	29	UPIC	45	C	0641.7	0642.1	0.6				
	127	TORN	40	F	1043	1054.3	14 U	17			
	1420	ARCE	2	S	1050.6	1050.7	0.5				
	930	BORD	46	C	1325.8	1326.4	1.5	33	2		
	930	BORD	46	C	1405.7	1406	21	21	2		
16	221	ABST	41	F	0614	0614.2	0.5	38	18		
	221	ABST	41	F	0619.8	0620	0.5	18	9		
	221	ABST	41	F	0639.2	0639.5	0.5	27	11		
	221	ABST	41	F	0644.8	0645.2	1	29	13		
	221	ABST	41	F	0704	0704.5	0.5	19	9		
17	9100	ARCE	1	S	0756.5	0756.7	0.4				
	9100	ARCE	2	S	0807.5	0807.7	0.8				
	3100	CRIM	24	R	0838	1000		3			
	29	UPIC	2	S/F	1457.9	1458.1	0.6				
	33	UPIC	2	S/F	1458	1458.3	1.3				
	9400	HUAN		S	2208	2231	32	16.7	6.1		
18	221	ABST	45	C	0603.5	0604.2	2	81	42		
	9400	HUAN		S	1544.8	1551.2	18	7.9	2.8		
	9400	HUAN		S	1612.9	1614.8	6.1	15.7	3.1		
19	9400	HUAN		S	1547.7	1549.9	5.3	15.9	5.1		
	9400	HUAN		S	1612.6	1613	1.1	14.3	6		
22	3100	CRIM	20	GRF	0820	0902	73	3	1		

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

MARCH 1977

MAR 1977	FREQUENCY	STATION	TYPE		STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	29	UPIC	2	S/F	1111.6	1112.2	0.7				
	33	UPIC	2	S/F	1111.7	1111.9	0.8				
23	4995	BOUL	1	S	1810	1811.5	2	10	3		
	4995	BOUL	8	S	1813.5	1815.5	4	50	16		
	2695	PENT	32	ABS	2010	2030	42	-0.8	-0.4		
	2800	OTTA	20	GRF	2045	2102	90	1.4	0.9		
24	930	BORD	8	S	0842.7	0842.8	0.2	23	1		
	930	BORD	8	S	0934.4	0934.4	0.1	11	1		
	930	BORD	8	S	1400.8	1400.8	0.1	22	1		
25	33	UPIC	1	S	1236.3	1236.4	0.3				
	29	UPIC	1	S	1236.3	1236.4	0.3				
	33	UPIC	42	SER	1436.5	1440.5	5.5				
	29	UPIC	42	SER	1436.5	1440.6	4.3				
26	33	UPIC	2	S/F	0809.2	0809.3	0.6				
	29	UPIC	2	S/F	0809	0809.2	0.6				
	9100	ARCE	22	GRF	0915.5	0945.5	64				
	1420	ARCE	1	S	0956.5	0956.6	0.4				
27	207	VORO			0151	0158		216			
	207	VORO	42	SER	0151	0153	9		8		
	500	HIRA	45	C	0156.2	0156.7	1.3	19	8		WL
	100	HIRA	45	C	0156.3	0157	1.5	1200	500		WL
	200	HIRA	45	C	0156.3	0157	1.7	900	250		WL
28	33	UPIC	2	S/F	1238.8	1239.8	1.6				
	29	UPIC	2	S/F	1239.3	1240.1	1.3				
29	3100	CRIM	24	R	0708	0851		6			
	550	KIEV	28	PRE	0958.5	0959.7	2	12			
	550	KIEV	40	F	1310	1312.9	4	3			
30	4995	BOUL	3	S	0029	0031	3.5	10	3		
	4995	BOUL	45	C	1843.5	1849.5	8.5	12	4		
	4995	BOUL	8	S	1920	1921	3	14	5		

Reports received from the following observatories:

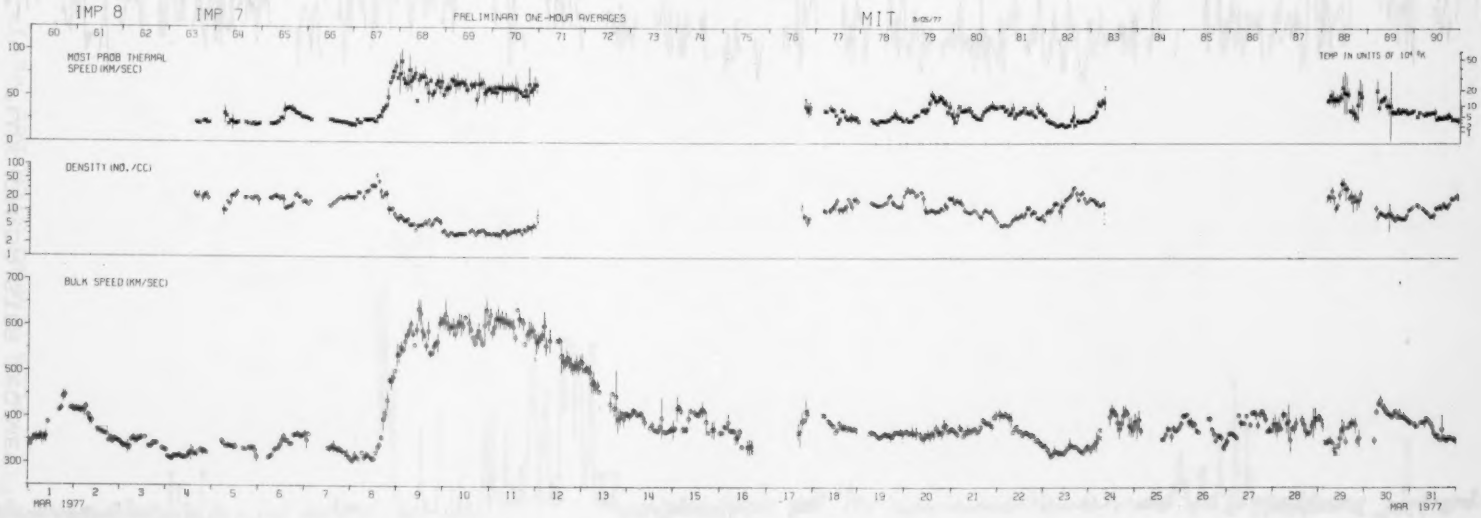
ARCE = Arcetri
BERL = Berlin-Adlershof
BORD = Bordeaux
BOUL = Boulder
CRIM = Simferopol
DWIN = Dwingeloo
GORK = Gorky
HARS = Harestua
HIRA = Hiraiso
HUAN = Huancayo
IRKU = Irkutsk
KIEV = Kiev
MANI = Manila
MCMA = McMath-Hulbert
ONDR = Ondrejov
OTTA = Ottawa
PENT = Penticton
POTS = Potsdam
SAOP = Sao Paulo
SGMR = Sagamore Hill
SYDN = Sydney
TORN = Torun
TYKW = Toyokawa
TRST = Trieste
VORO = Voroshilov (Ussurisk)

Explanation of Type Code:

1 Simple 1
2 Simple 1F
3 Simple 2
4 Simple 2F
5 Simple
6 Minor
7 Minor +
8 Spike
20 Simple 3
21 Simple 3A
22 Simple 3F
23 Simple 3AF
24 Rise
25 Rise A
26 Fall
27 Rise and Fall
28 Precursor
29 Post Burst Increase
30 Post Burst Increase A
31 Post Burst Decrease
32 Absorption
40 Fluctuation
41 Group of Bursts
42 Series of Bursts
43 Onset of Noise Storm
44 Noise Storm in Progress
45 Complex
46 Complex F
47 Great Burst
48 Major
49 Major +

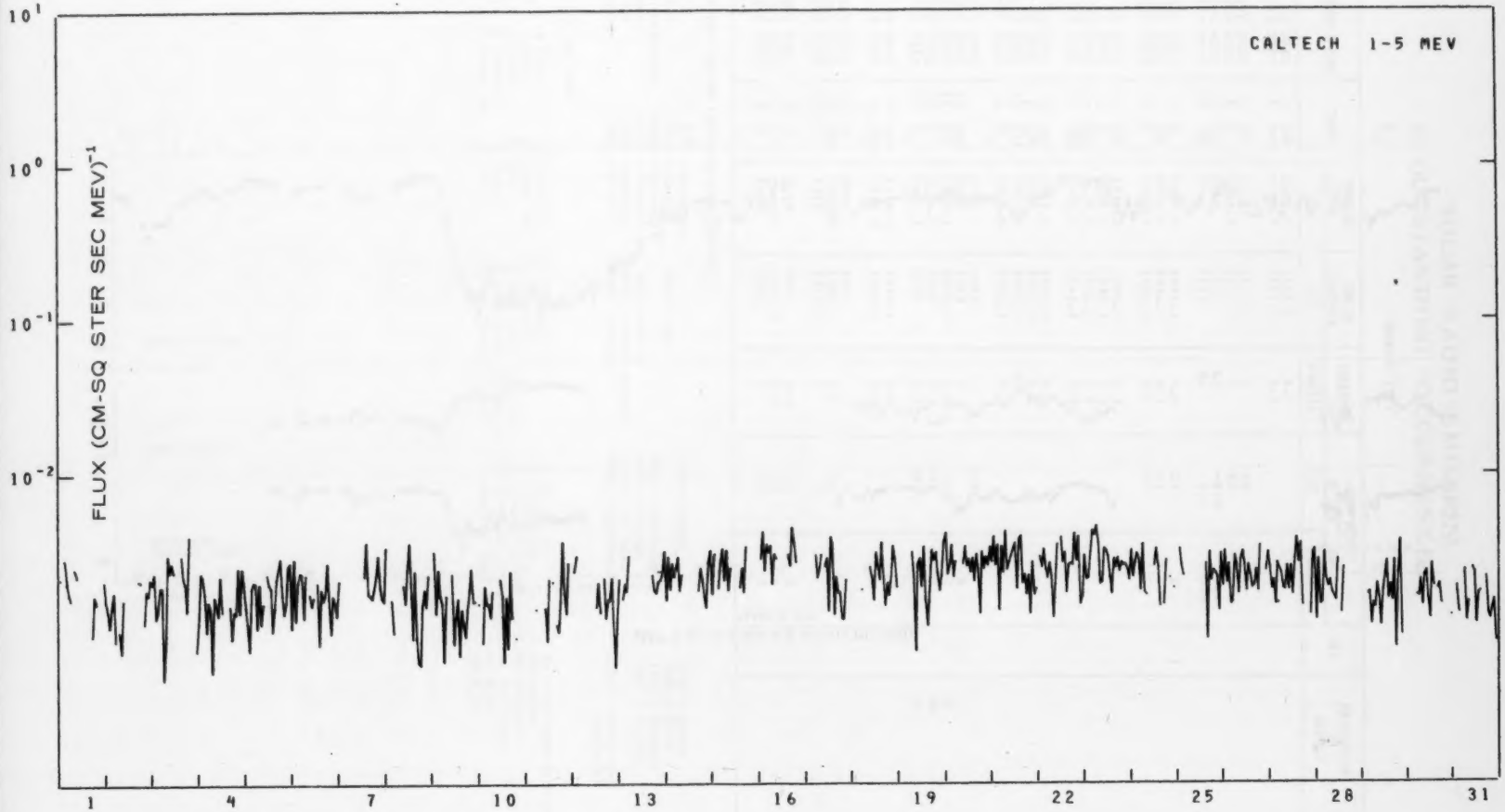
IMP 7 AND 8 SOLAR WIND PLASMA

MARCH 1977



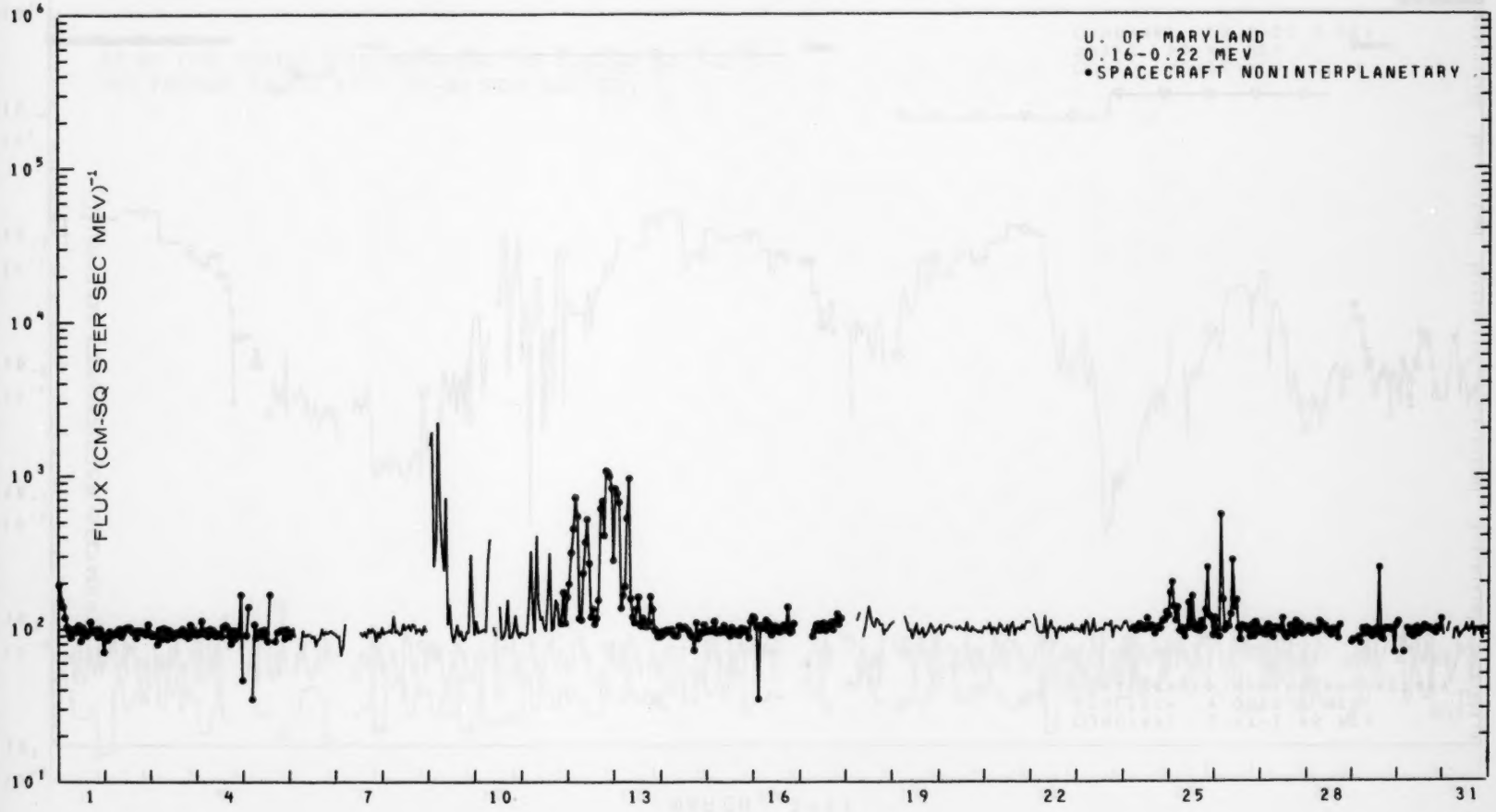
IMP 7 AND 8 ELECTRONS

MARCH, 1977



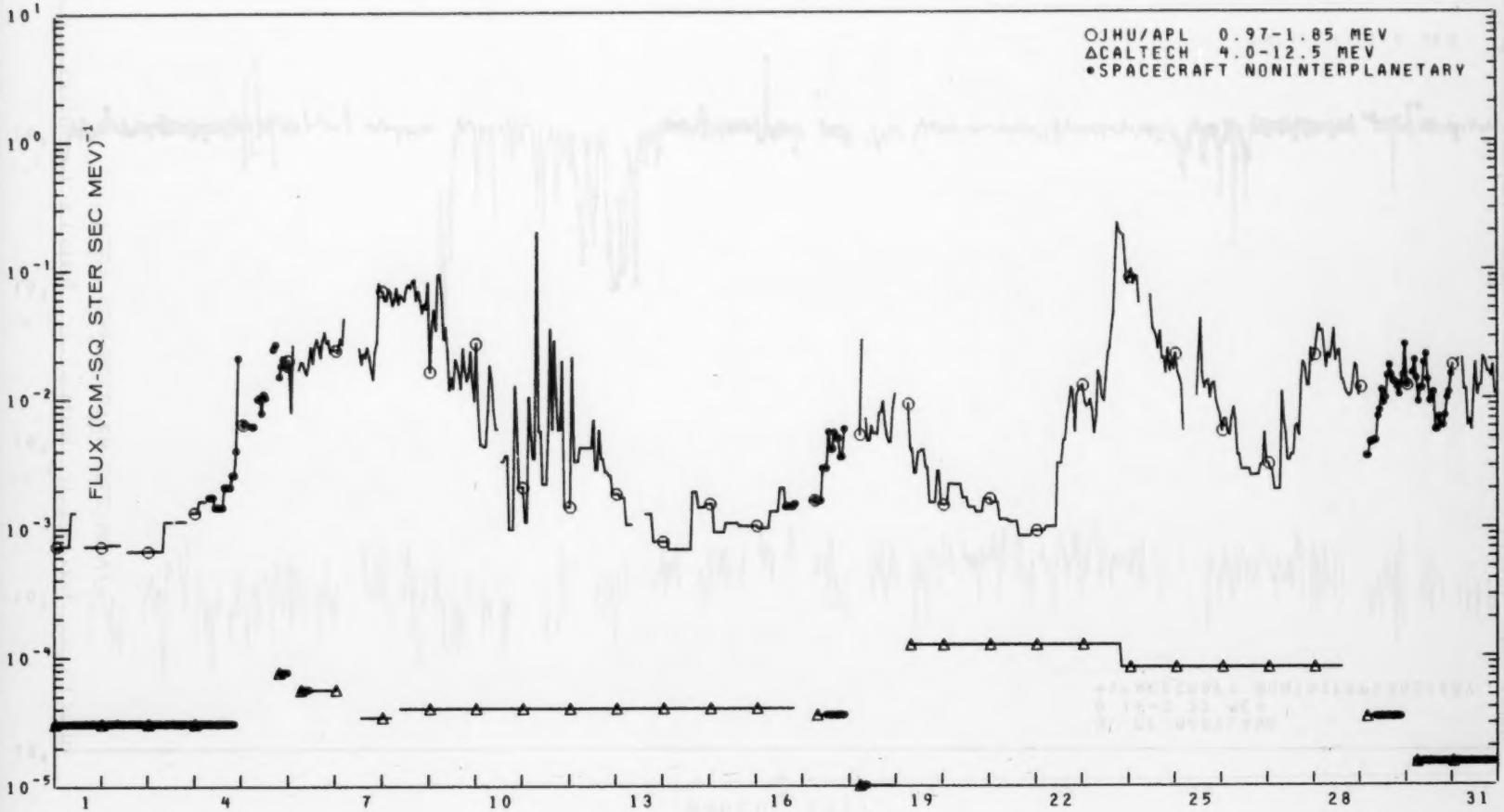
IMP 7 AND 8 LOW ENERGY PROTONS

MARCH, 1977



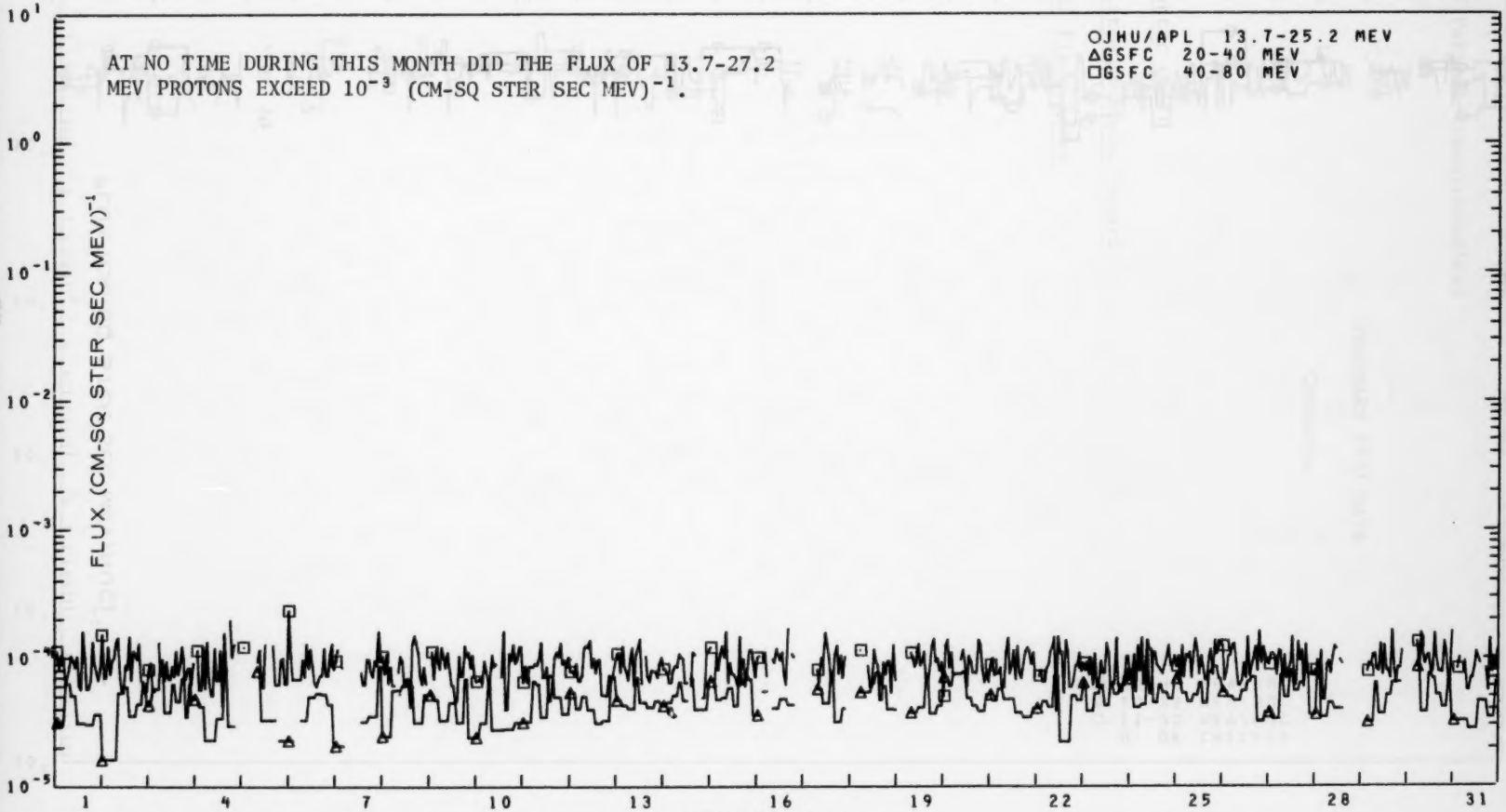
IMP 7 AND 8 INTERMEDIATE ENERGY PROTONS

MARCH, 1977



IMP 7 AND 8 HIGH ENERGY PROTONS

MARCH, 1977

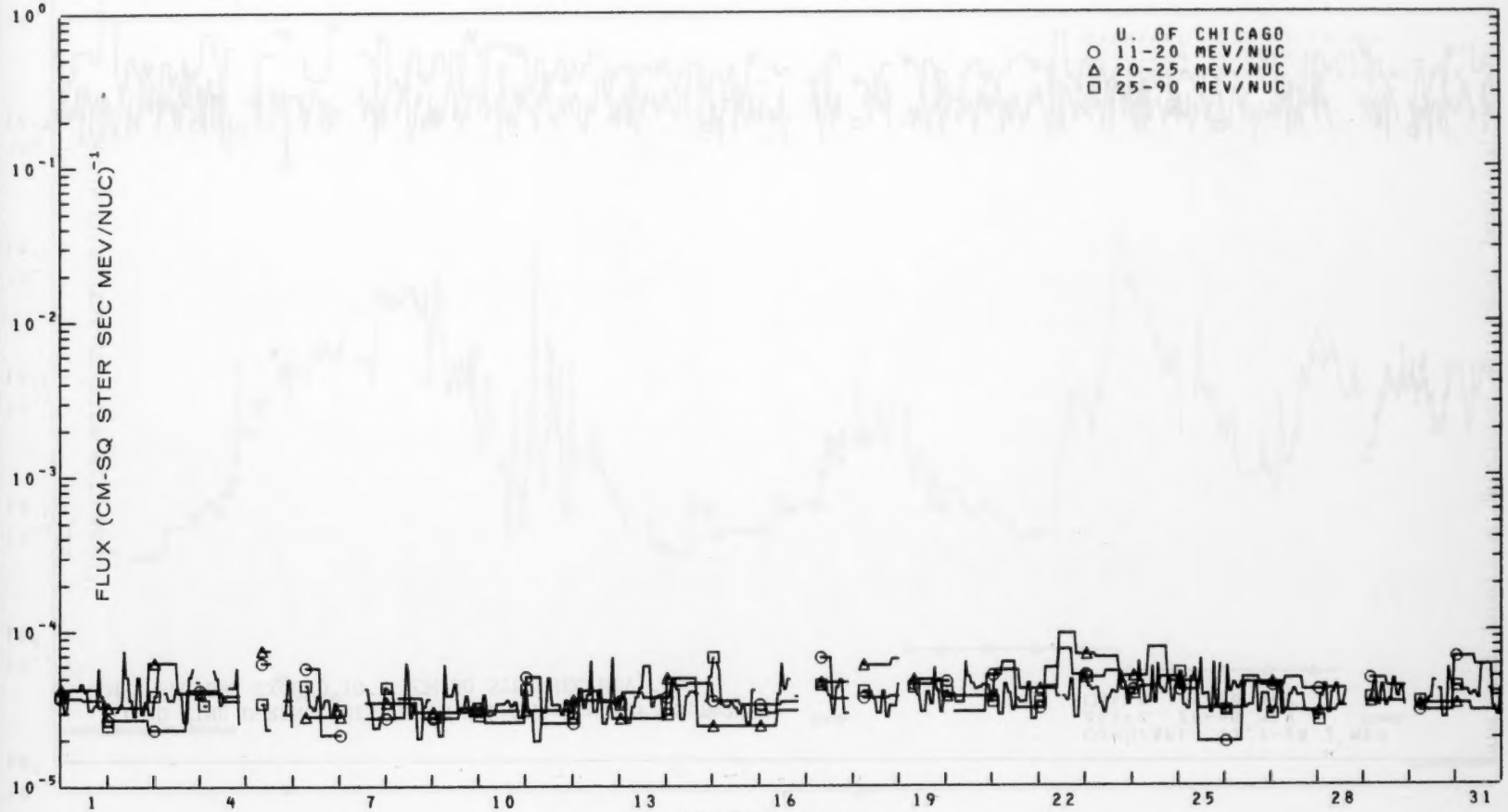


19 Mar 77

20 Mar 77

IMP 7 AND 8 ALPHA PARTICLES

MARCH, 1977



FEBRUARY 1977 DATA

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Hα Synoptic Chart	22-23
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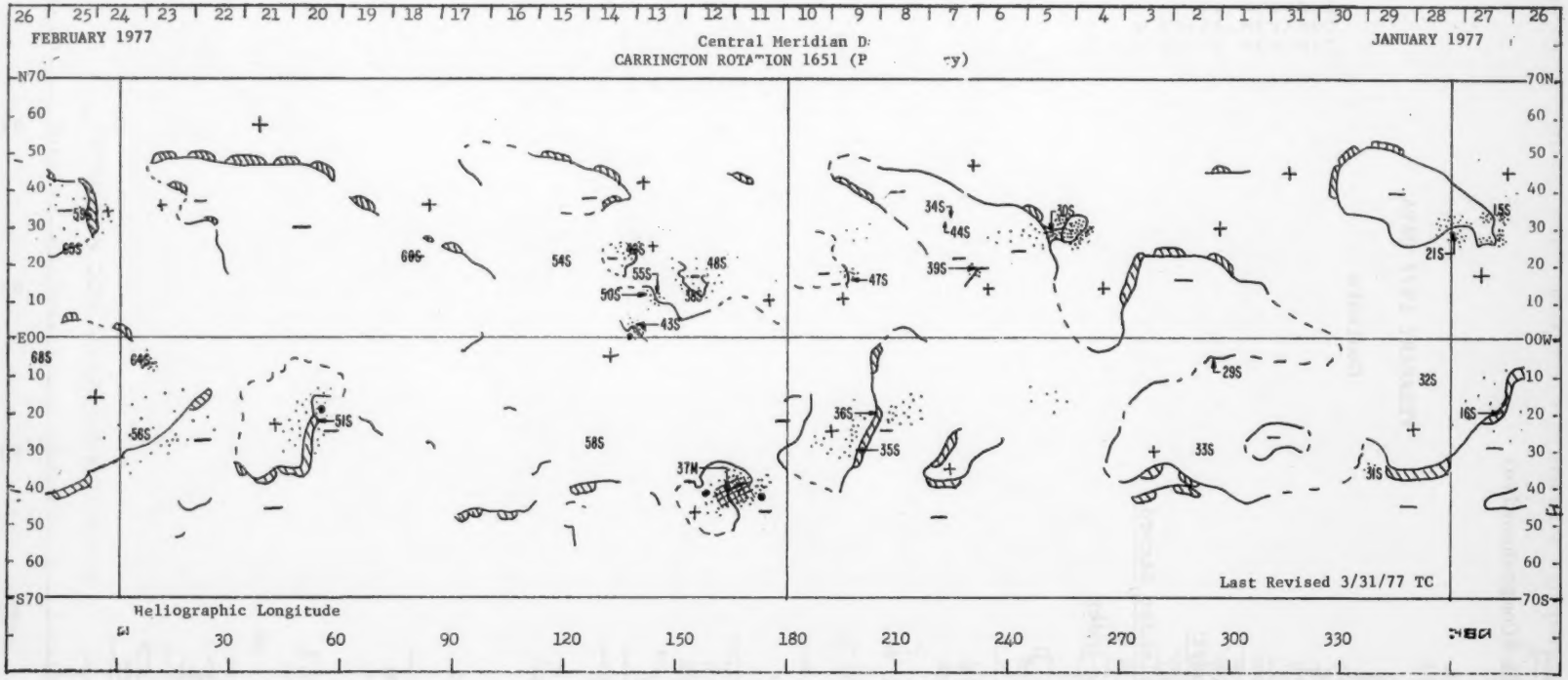
ABBREVIATED CALENDAR RECORD

Hα SYNOPTIC CHART

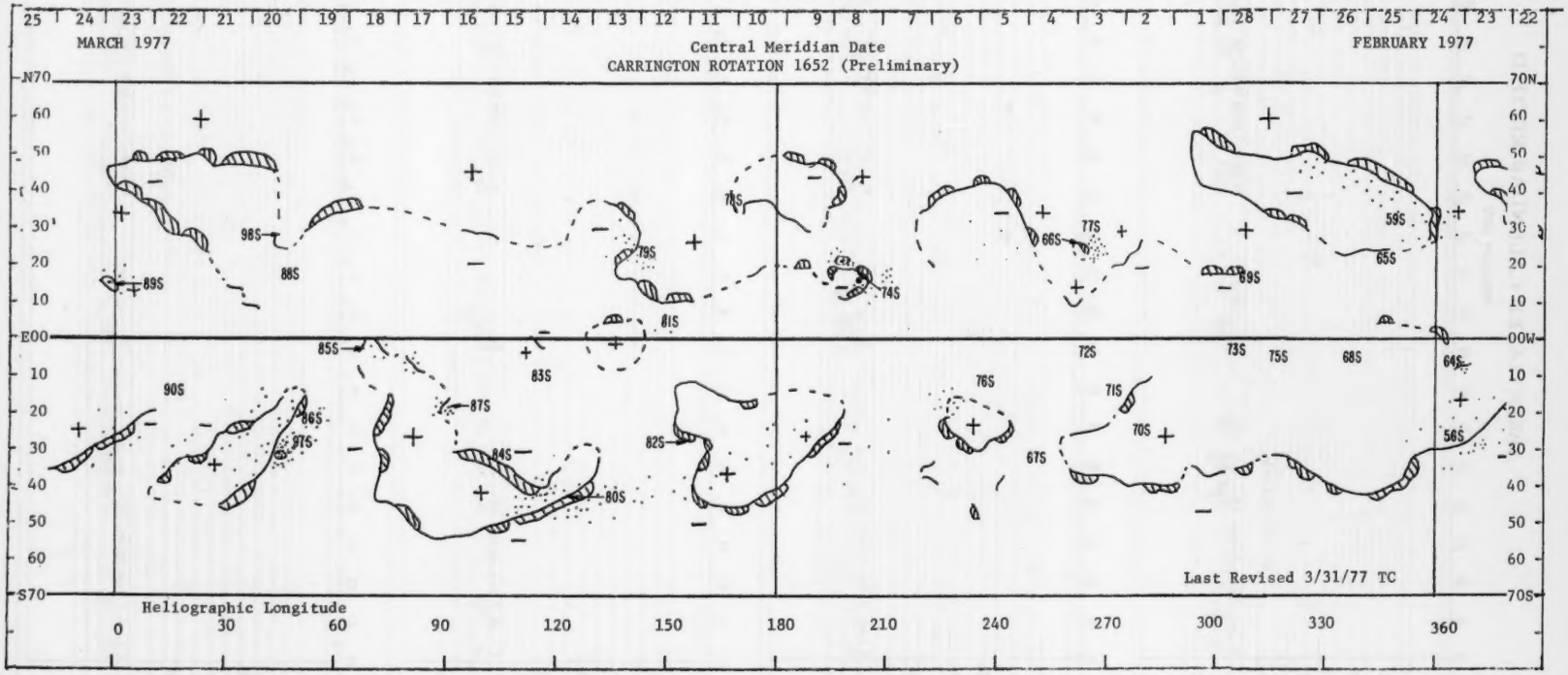
JANUARY 1977 - FEBRUARY 1977



ABBREVIATED CALENDAR RECORD

Hα SYNOPTIC CHART

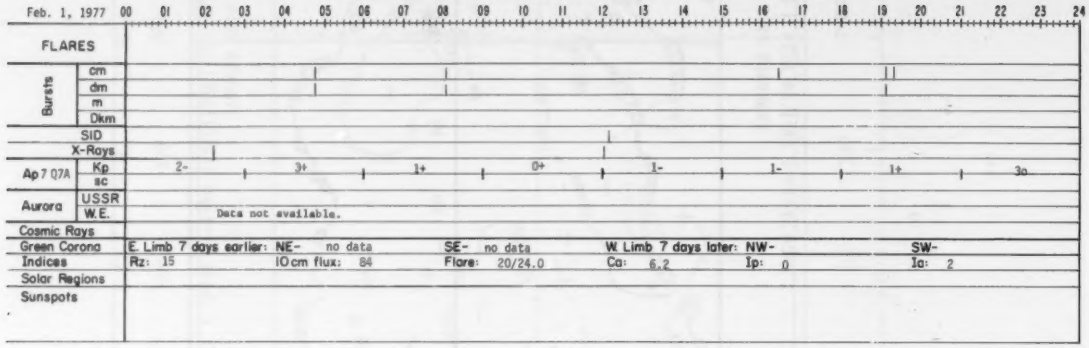
FEBRUARY 1977 - MARCH 1977

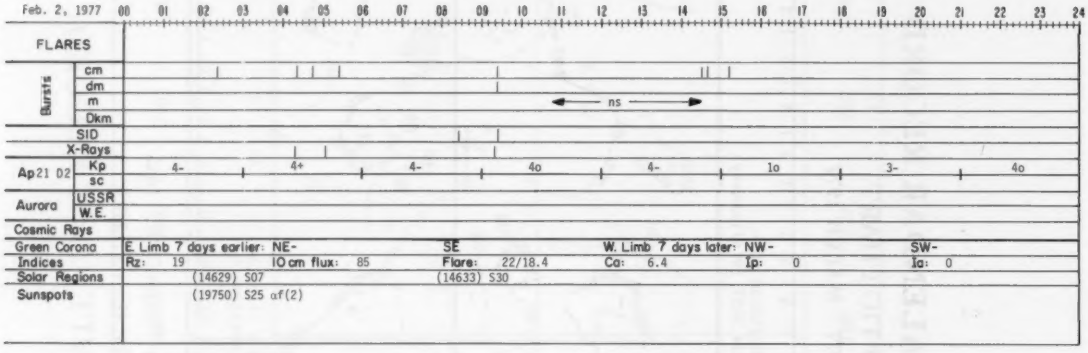


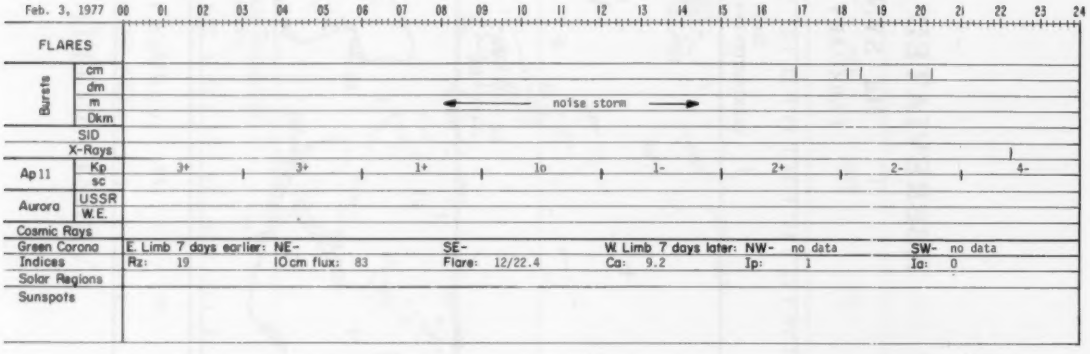
23 Feb 77

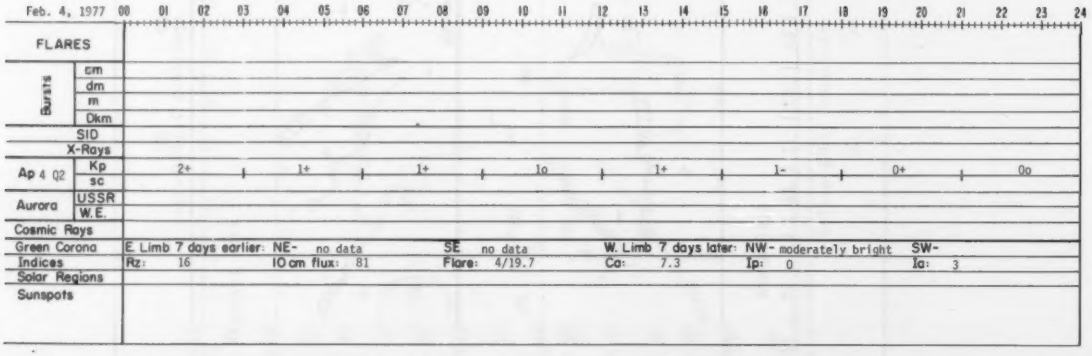
ABBREVIATED CALENDAR RECORD

FEBRUARY 1977









Feb. 5, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 9 — Kp: 0o 1o 4o 3o 2o 3- 1o 2-

sc

Aurora: USSR, W.E.

Cosmic Rays

Green Corona: E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW-moderately bright SW-

Indices: Rz: 18 10cm flux: 80 Flare: 0/22.2 Ca: 9.0 Ip: 0 Ia: 3

Solar Regions: (14630) N27

Sunspots: (19751) N26 (β)4

Feb. 6, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 14 — Kp: 2+ 1+ 1+ 3- 3o 3o 4- 4+

sc

Aurora: USSR: ϕ = 59° 1900-2300 (HB1); W.E.

Cosmic Rays

Green Corona: E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW-moderately bright SW-

Indices: Rz: 7 10cm flux: 77 Flare: 2/22.8 Ca: 8.3 Ip: 0 Ia: 1

Solar Regions

Sunspots

Feb. 7, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap18 D3 — Kp: 4+ 3+ 2+ 3- 3o 3o 4- 4-

sc

Aurora: USSR: ϕ = 58° 0000(HB2) and 1800-2200 (R_2B); ϕ = 59° 2300 (HA2); W.E.

Cosmic Rays

Green Corona: E. Limb 7 days earlier: NE- moderately bright SE- moderately bright W. Limb 7 days later: NW- SW-

Indices: Rz: 7 10cm flux: 77 Flare: 3/23.7 Ca: 9.3 Ip: 0 Ia: 2

Solar Regions: (14639) N20 (14634) N33 (14644) N32

Sunspots: (19753) N18 (αp)4

Feb. 8, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap18 D4 — Kp: 3+ 3o 3- 2+ 3- 4o 4o 4o

sc

Aurora: USSR: ϕ = 59° 0000 (HA2), 0100 (HB1) and 2100-2200 (HA2); W.E.

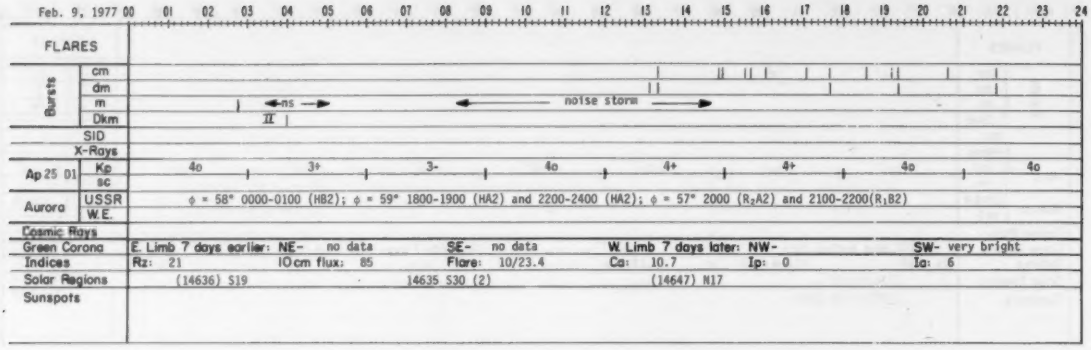
Cosmic Rays

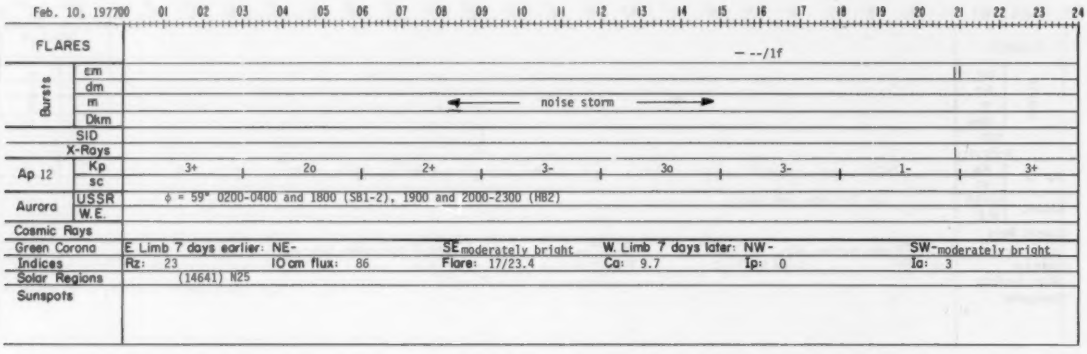
Green Corona: E. Limb 7 days earlier: NE- moderately bright SE bright W. Limb 7 days later: NW- SW- moderately bright

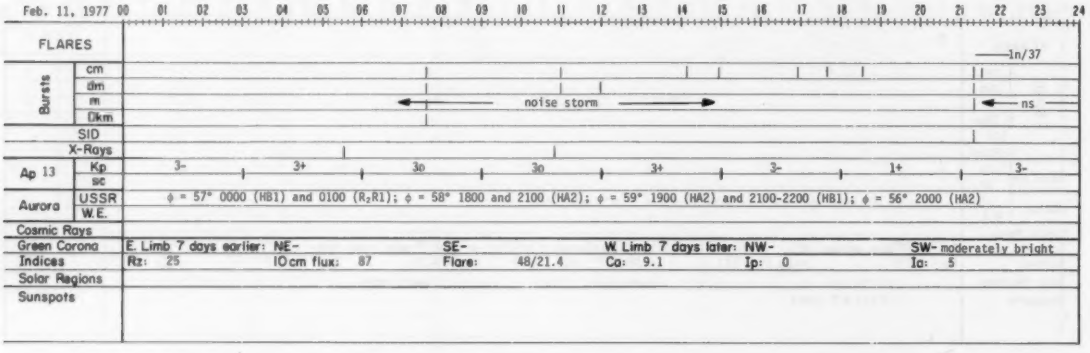
Indices: Rz: 26 10cm flux: 81 Flare: 19/24.0 Ca: 11.7 Ip: 0 Ia: 3

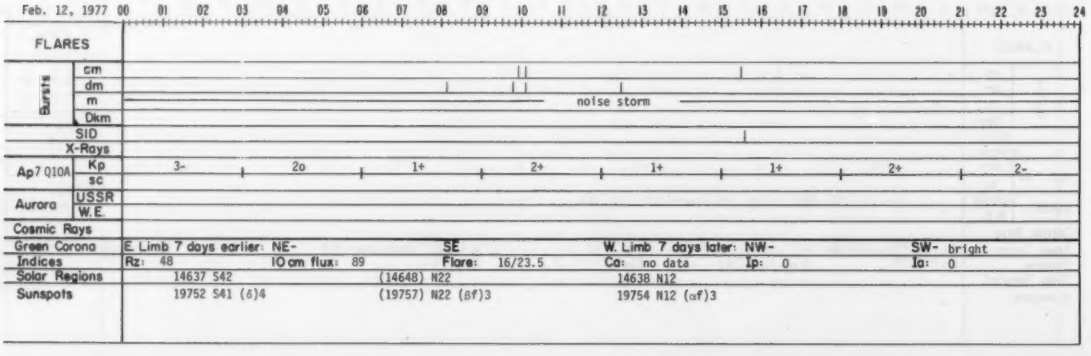
Solar Regions

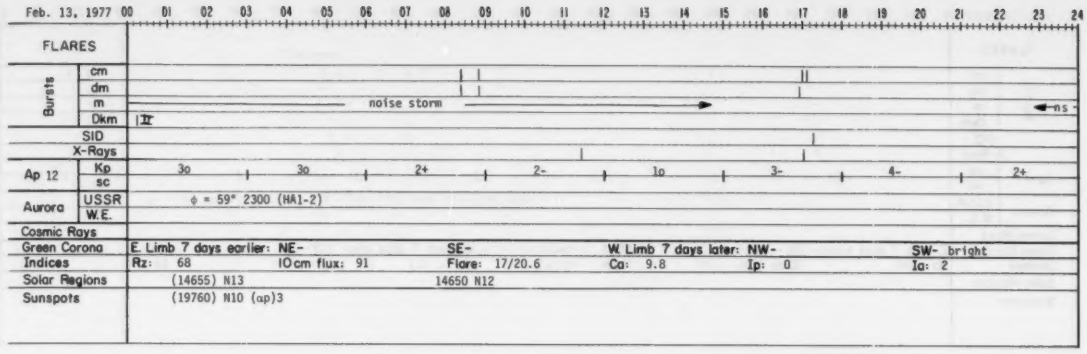
Sunspots

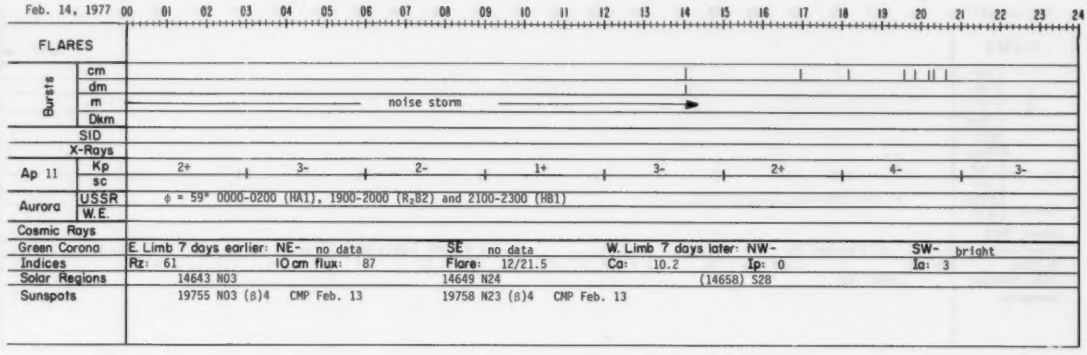

Feb. 9, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
ns
II
noise storm
SID
X-Rays
Ap 25 01
Kp
sc
4o 3+ 3- 4o 4+ 4+ 4o 4o
Aurora
USSR
W.E.
φ = 58° 0000-0100 (HB2); φ = 59° 1800-1900 (HA2) and 2200-2400 (HA2); φ = 57° 2000 (R2A2) and 2100-2200(R1B2)
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- SW- very bright
Indices
Rz: 21 10cm flux: 85 Flare: 10/23.4 Ca: 10.7 Ip: 0 Ia: 6
Solar Regions
(14636) S19 14635 S30 (2) (14647) N17
Sunspots

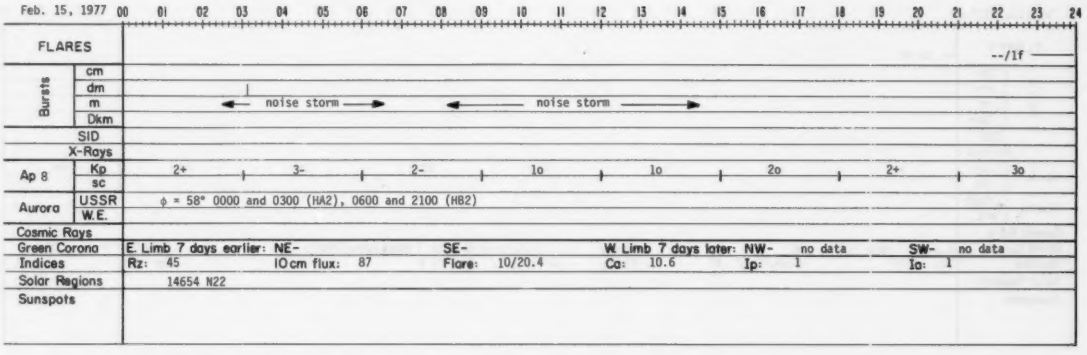

Feb. 10, 197700 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
--/1f
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 12
Kp
sc
3+ 2o 2+ 3- 3o 3- 1- 3+
Aurora
USSR
W.E.
φ = 59° 0200-0400 and 1800 (SB1-2), 1900 and 2000-2300 (HB2)
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE moderately bright W. Limb 7 days later: NW- SW- moderately bright
Indices
Rz: 23 10cm flux: 86 Flare: 17/23.4 Ca: 9.7 Ip: 0 Ia: 3
Solar Regions
(14641) N25
Sunspots

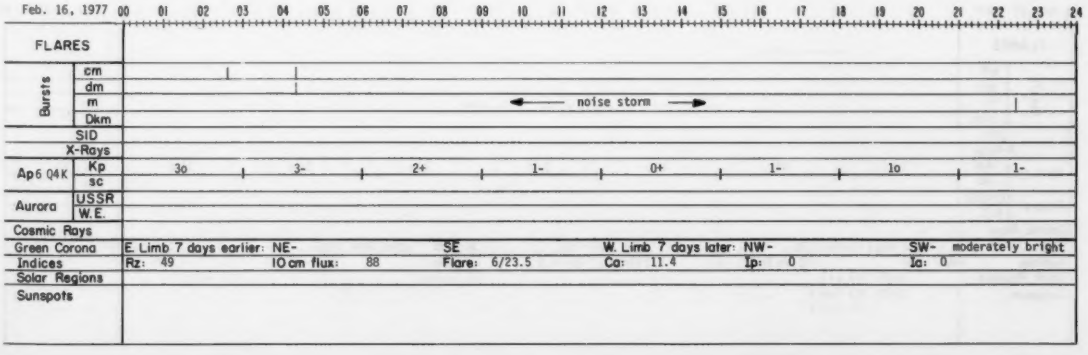

Feb. 11, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/37
Bursts
cm
dm
m
Dkm
noise storm
ns
SID
X-Rays
Ap 13
Kp
sc
3- 3+ 3o 3o 3+ 3- 1+ 3-
Aurora
USSR
W.E.
φ = 57° 0000 (HB1) and 0100 (R2R1); φ = 58° 1800 and 2100 (HA2); φ = 59° 1900 (HA2) and 2100-2200 (HB1); φ = 56° 2000 (HA2)
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- SW- moderately bright
Indices
Rz: 25 10cm flux: 87 Flare: 48/21.4 Ca: 9.1 Ip: 0 Ia: 5
Solar Regions
Sunspots

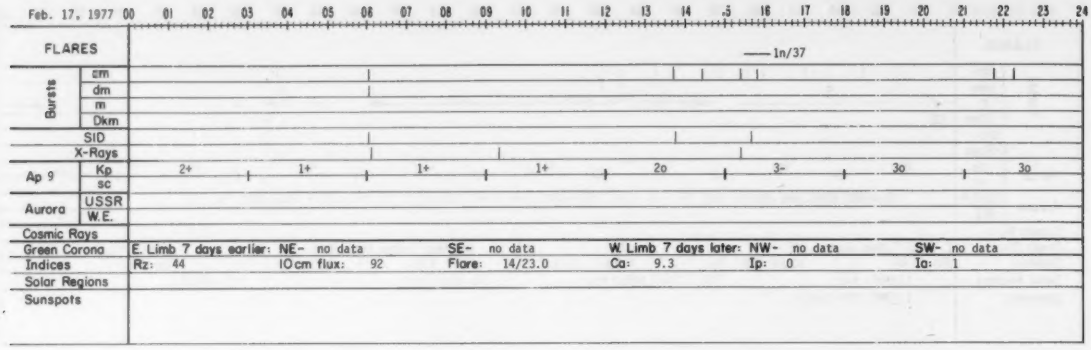

Feb. 12, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap7 Q10A
Kp
sc
3- 2o 1+ 2+ 1+ 1+ 2+ 2-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- SW- bright
Indices
Rz: 48 10cm flux: 89 Flare: 16/23.5 Ca: no data Ip: 0 Ia: 0
Solar Regions
14637 S42 (14648) N22 14638 N12
Sunspots
19752 S41 (δ)4 (19757) N22 (βf)3 19754 N12 (αf)3

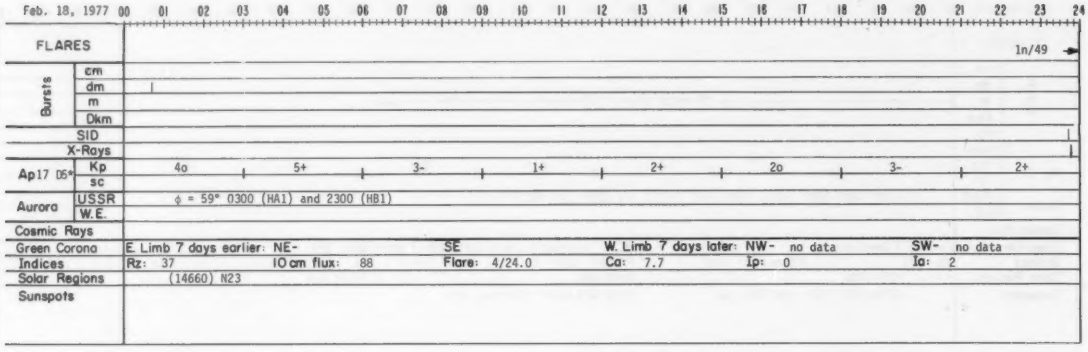

Feb. 13, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
ns
SID
X-Rays
Ap 12
Kp
sc
3o 3o 2+ 2- 1o 3- 4- 2+
Aurora
USSR
W.E.
ϕ = 59° 2300 (HA1-2)
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE-
SE-
W. Limb 7 days later: NW-
SW- bright
Indices
Rz: 68
10cm flux: 91
Flare: 17/20.6
Ca: 9.8
Ip: 0
Ia: 2
Solar Regions
(14655) N13
14650 N12
Sunspots
(19760) N10 (αp)3

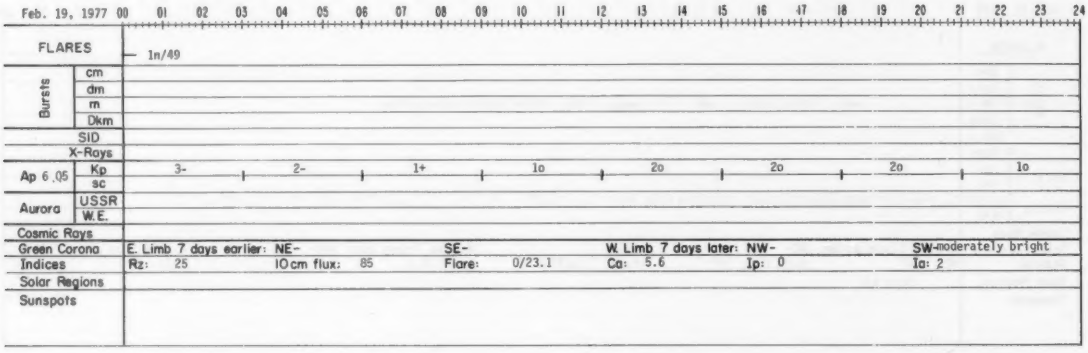

Feb. 14, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 11
Kp
sc
2+ 3- 2- 1+ 3- 2+ 4- 3-
Aurora
USSR
W.E.
ϕ = 59° 0000-0200 (HA1), 1900-2000 (R2B2) and 2100-2300 (HB1)
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data
SE no data
W. Limb 7 days later: NW-
SW- bright
Indices
Rz: 61
10cm flux: 87
Flare: 12/21.5
Ca: 10.2
Ip: 0
Ia: 3
Solar Regions
14643 N03
14649 N24
(14658) S28
Sunspots
19755 N03 (β)4 CMP Feb. 13
19758 N23 (β)4 CMP Feb. 13

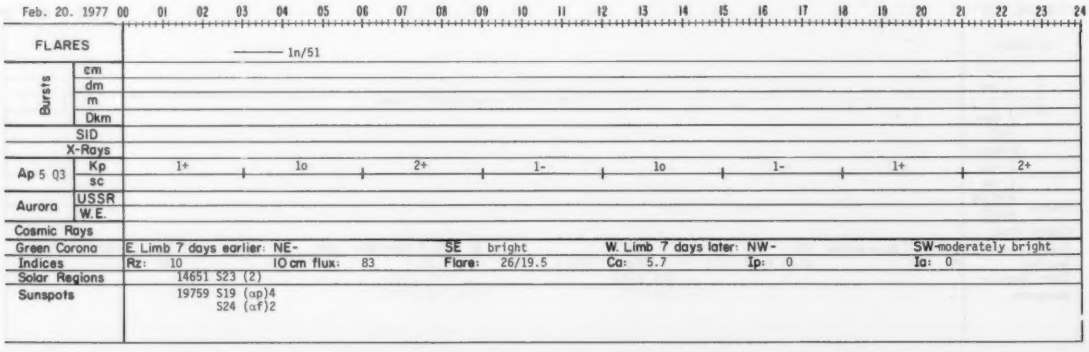

Feb. 15, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
--/1f
Bursts
cm
dm
m
Dkm
noise storm
noise storm
SID
X-Rays
Ap 8
Kp
sc
2+ 3- 2- 1o 1o 2o 2+ 3o
Aurora
USSR
W.E.
ϕ = 58° 0000 and 0300 (HA2), 0600 and 2100 (HB2)
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE-
SE-
W. Limb 7 days later: NW- no data
SW- no data
Indices
Rz: 45
10cm flux: 87
Flare: 10/20.4
Ca: 10.6
Ip: 1
Ia: 1
Solar Regions
14654 N22
Sunspots

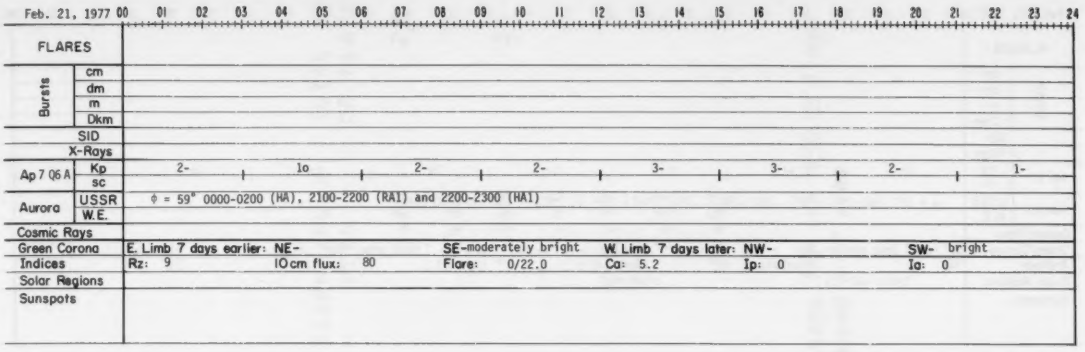

Feb. 16, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap6 Q4K
Kp
sc
3o 3- 2+ 1- 0+ 1- 1o 1-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE-
SE
W. Limb 7 days later: NW-
SW- moderately bright
Indices
Rz: 49
10cm flux: 88
Flare: 6/23.5
Ca: 11.4
Ip: 0
Ia: 0
Solar Regions
Sunspots

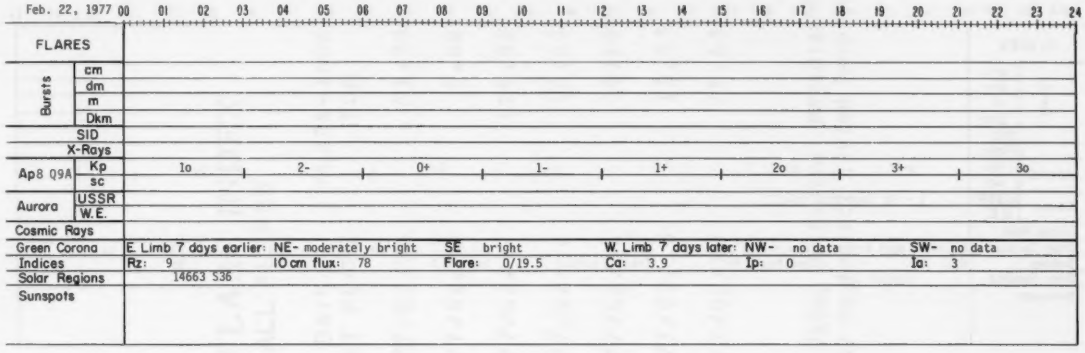

Feb. 17, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/37
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 9
Kp
2+ 1+ 1+ 1+ 2o 3- 3o 3o
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 44 10cm flux: 92 Flare: 14/23.0 Ca: 9.3 Ip: 0 Ia: 1
Solar Regions
Sunspots

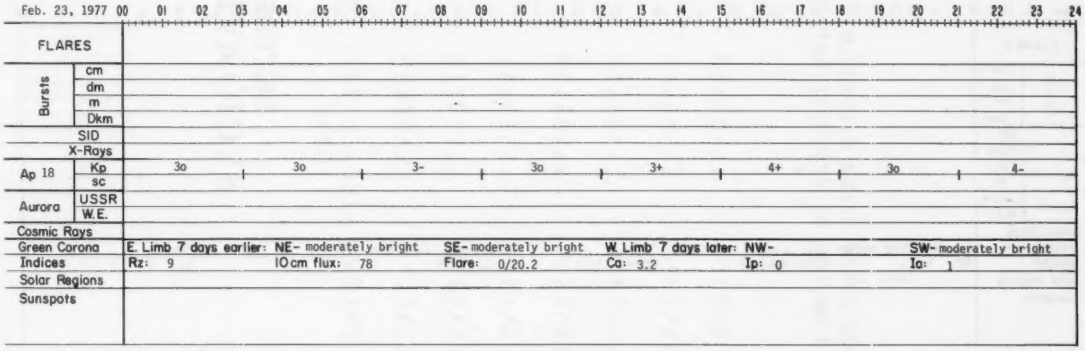

Feb. 18, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/49
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap17 05*
Kp
4o 5+ 3- 1+ 2+ 2o 3- 2+
sc
Aurora
USSR
W.E.
φ = 59° 0300 (HA1) and 2300 (HB1)
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 37 10cm flux: 88 Flare: 4/24.0 Ca: 7.7 Ip: 0 Ia: 2
Solar Regions
(14660) N23
Sunspots

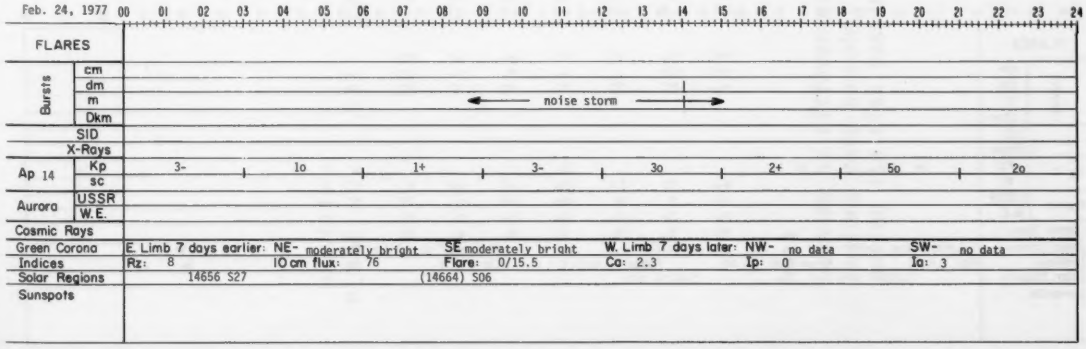

Feb. 19, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/49
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 6 05
Kp
3- 2- 1+ 1o 2o 2o 2o 1o
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- SW-moderately bright
Indices
Rz: 25 10cm flux: 85 Flare: 0/23.1 Ca: 5.6 Ip: 0 Ia: 2
Solar Regions
Sunspots


Feb. 20. 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/51
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 5 03
Kp
1+ 1o 2+ 1- 1o 1- 1+ 2+
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE bright W. Limb 7 days later: NW- SW-moderately bright
Indices
Rz: 10 10cm flux: 83 Flare: 26/19.5 Ca: 5.7 Ip: 0 Ia: 0
Solar Regions
14651 S23 (2)
Sunspots
19759 S19 (αp)4
S24 (αf)2


Feb. 21, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 7 Q6 A
Kp
2- 1o 2- 2- 3- 3- 2- 1-
sc
Aurora
USSR
W.E.
φ = 59° 0000-0200 (HA), 2100-2200 (RA1) and 2200-2300 (HA1)
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE-
SE-moderately bright
W. Limb 7 days later: NW-
SW- bright
Indices
Rz: 9
10cm flux: 80
Flare: 0/22.0
Ca: 5.2
Ip: 0
Ia: 0
Solar Regions
Sunspots


Feb. 22, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap8 Q9A
Kp
1o 2- 0+ 1- 1+ 2o 3+ 3o
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright
SE bright
W. Limb 7 days later: NW- no data
SW- no data
Indices
Rz: 9
10cm flux: 78
Flare: 0/19.5
Ca: 3.9
Ip: 0
Ia: 3
Solar Regions
14663 S36
Sunspots


Feb. 23, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 18
Kp
3o 3o 3- 3o 3+ 4+ 3o 4-
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright
SE- moderately bright
W. Limb 7 days later: NW-
SW- moderately bright
Indices
Rz: 9
10cm flux: 78
Flare: 0/20.2
Ca: 3.2
Ip: 0
Ia: 1
Solar Regions
Sunspots


Feb. 24, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
noise storm
Dkm
SID
X-Rays
Ap 14
Kp
3- 1o 1+ 3- 3o 2+ 5o 2o
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright
SE moderately bright
W. Limb 7 days later: NW- no data
SW- no data
Indices
Rz: 8
10cm flux: 76
Flare: 0/15.5
Ca: 2.3
Ip: 0
Ia: 3
Solar Regions
14656 S27
(14664) S06
Sunspots

Feb. 25, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 11 — Kp: 3+ | 3- | 2o | 2- | 1+ | 2o | 3o | 3+ ; sc

Aurora — USSR: ϕ = 59° 0000-0400 (HB2), 2200 (SA1), 2300 (R1A1); ϕ = 58° 1800, 2100 and 2400 (HP2) ; W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- bright; SE- moderately bright; W. Limb 7 days later: NW- no data; SW- no data

Indices — Rz: 8; 10cm flux: 76; Flare: 0/23.9; Ca: 1.3; Ip: 0; Ia: 4

Solar Regions — 14659 N33 (2); 14665 N24

Sunspots

Feb. 26, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 8 Q8A — Kp: 3o | 3o | 1- | 1+ | 1+ | 2- | 2o | 1o ; sc

Aurora — USSR: ϕ = 59° 0000-0200 (HA1) ; W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE-moderately bright; SE; W. Limb 7 days later: NW- no data; SW- no data

Indices — Rz: 8; 10cm flux: 74; Flare: 0/23.3; Ca: 0.7; Ip: 0; Ia: 1

Solar Regions — (14668) S05

Sunspots

Feb. 27, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 3 Q1 — Kp: 0+ | 0o | 0+ | 1- | 1o | 1- | 1- | 2- ; sc

Aurora — USSR ; W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- moderately bright; SE-; W. Limb 7 days later: NW-; SW-

Indices — Rz: 0; 10cm flux: 73; Flare: 0/19.5; Ca: 0.8; Ip: 0; Ia: 2

Solar Regions — (14675) S06

Sunspots

Feb. 28, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 7 — Kp: 3+ | 2o | 2- | 2o | 1- | 0+ | 2o | 2+ ; sc

Aurora — USSR ; W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE-; SE; W. Limb 7 days later: NW-; SW-

Indices — Rz: 0; 10cm flux: 74; Flare: 0/23.6; Ca: 1.8; Ip: 0; Ia: 0

Solar Regions — (14669) N16; (14673) S03

Sunspots

REGIONAL FLARE INDEX

INCLUDES ALL FLARES

MC MATH PLAGE NO.	LAT	CMP DATE	DATE FIRST FLARE	DATE LAST FLARE	FLARE-INDEX SUM	FLARE-INDEX MEAN	TOTAL NO. OF FLARES
14630	N28	77/02/05.1	77/01/30	77/02/08	61.99	6.20	28
14647	N17	77/02/09.6	77/02/13	77/02/15	5.60	1.87	2
14637	S41	77/02/12.1	77/02/07	77/02/17	125.92	11.45	36
14638	N12	77/02/12.8	77/02/09	77/02/10	16.80	8.40	2
14643	N 4	77/02/14.0	77/02/12	77/02/18	9.60	1.37	3
14649	N24	77/02/14.0	77/02/13	77/02/18	13.03	2.17	4
14651	S23	77/02/20.6	77/02/20	77/02/20	25.63	25.63	2

Note:

Because of differences in method of calculation, the dates of Central Meridian Passage for the McMath Plage Regions vary somewhat from those given elsewhere. Any region not listed here produced no flares during its disk passage.

Miscellaneous Data

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SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

JUNE 1977

	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
01	0000	0730	CULG	0000	0730		0000	0034					IS,W
			CULG				0244.5	0414					IIIN,W
			CULG				0335.5	0336.5					IIIG,W,U
			CULG				0341	0342.5	2				IIIG,U
			CULG				0414	0455	1				IIIN,W
			CULG				0455	0730					IIIN,W
	0408	1530	WEIS				0612.3	0612.5	2				IIIB
			CULG				0612	0613	2				IIIG,V
	1540	1830	WEIS										
	2030	2400	CULG				2030	2400					IS,W
			CULG				2030	2330					IIIN,W
02	0000	0730	CULG				0000	0640					IS,W
	0409	1258	WEIS				0413.3	1515	2				IS
			WEIS				0426.8	0432.5	2				IIIG
			CULG				0426	0432	2	0429	0430	1	IIIGG
			CULG				0430	0433	1				
			CULG				0451						IIIB,W
			WEIS				0530.5	0432.5	2				II
			CULG				0632	0641					IIIG,W
			WEIS				0806.5	0810.6	2				IIIG
	1422	1712	WEIS				1710.6	1711.0	2				IIIG
	2030	2400	CULG				2350	2351.5					IIIG,W
			CULG				2358		1				IIIB
03	0000	0730	CULG				0022	0025.5					IIIG,W
			CULG				0311	0730					IS,W
			CULG	0618	0730	1							IS
	0758	0959	WEIS				0923.5	0924.3	1				IIIG
	1009	1832	WEIS				1046.6	1046.7	1				IIIB
	2030	2400	CULG	2030	2130		2030	2400					IS,W
			CULG				2030	2400					IIIN,W
			CULG	2203	2205.5	1	2202.5	2205	2				IIIG
			CULG				2313.5	2314.5	1				IIIB,U
			CULG				2324	2325	2				IIIG,U
04			CULG				0000	0525					IIIN,W
	0000	0719	CULG				0000	0120					IN,W
			CULG	0015.5	0019	1	0015.5	0019.5	1	0015.5	0017	1	IIIG,U
			CULG				0044	0045	1				IIIG,V
			CULG	0046	0047	1	0046	0047	2				IIIG,V,U
			CULG	0100	0719								IS,W
			CULG				0234.5	0235					IIIG,W,U
			CULG				0334.5	0335.5	1				IIIG
			CULG				0522.5		1				IIIB
	0408	1321	WEIS				1118.9	1119.2	1				IIIG
			WEIS				1207.3	1207.6	1				IIIB
			WEIS				1347.0	1354	2				IN
	1331	1833	WEIS				1720.5	1720.6	1				IIIB
	2030	2400	CULG	2100	2400	1	2100	2400	1				IS,DC
			CULG				2100	2400	1				IIIS
			CULG				2332.5	2333	2				IIIG
05			CULG				0000	0729	1				IIIS
	0000	0729	CULG	0000	0729	1	0000	0729	1				IS,DC
			CULG				0457		2				IIIB
	0406	0818	WEIS				0520.9	0521.0	1				IIIB
			WEIS				0524.9	0525.0	1				IIIB
			CULG				0525		2				IIIB
			WEIS				0617.4	0617.7	1				IIIG
			WEIS				0710.2	0710.3	1				IIIG
			WEIS				0713.6	0713.7	1				IIIB
			WEIS				0749.0	0751.3	1				IIIG
			WEIS				0805.2	0805.4	1				IIIB
	0857	1834	WEIS				0857.0	1241.0					IN
			WEIS				1240.2	1240.5	1				IIIB
			WEIS				1411.7	1411.8	1				IIIB
			CULG				2100	2400	1				N,RS,DP
			CULG	2100	2400	1							C
			CULG				2100	2400	1				IIIS

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

JUNE 1977

	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
05	2031	2400	CULG				2100	2400	1				IS,DC,C
06			CULG	0000	0705	1							C
			CULG				0000	0340	1				IIIS
			CULG				0000	0700	1				N,RS,DP
	0000	0727	CULG				0000	0700	1				IS,C
			CULG				0305	0306.5	2	0305.5	0306.5	1	IIIGG
			CULG				0308.5	0309	1				IIIG
			CULG				0340	0355	2				IIIS
			CULG				0355	0700	1				IIIS
	0408	1258	WEIS				0414.0	0750.0	2				IS/R
			WEIS				0414	0750.0					IN
			WEIS				0522	1724.3					IIIS/RS
			CULG				0603	0603.5	2				IIIG
			CULG				0605		2				IIIB
			WEIS				0629.6	0629.7	1				IIIB
			WEIS				0631.7	0631.8	3				IIIG
	1323	1404	WEIS										
	1407	1834	WEIS				1548.3	1548.4	3				IIIB
			CULG				2100	2400	2				IIIS
	2030	2400	CULG	2100	2400	1	2100	2400	1				IS,C
			CULG				2100	2400	2				S,RS,DP
07	0000	0730	CULG				0000	0730	1				IS,C
			CULG				0000	0155	2				IIIS
			CULG	0000	0544	1							C
			CULG				0000	0155	2				S,RS,DP
			CULG				0155	0700	2				IIIS
			CULG				0155	0700	2				S,RS,DP
	0406	1835	WEIS				0411	1820	2				IIIS
			WEIS				0931.8	0932.2	3				IIIG
			WEIS				0942.7	0943	3				IIIB
			WEIS				1120	1832.5	2				IS
	2100	2400	CULG	2100	2400	1	2100	2400	2				C
			CULG				2100	2400	2				S,RS,DP
			CULG				2100	2400	2				IIIS
			CULG				2100	2400	2				IS,CHAINS,
08	0000	0730	CULG	0000	0334	1	0000	0120	1				IS,C,DC
			CULG				0000	0625	1				S,RS,DP
			CULG				0000	0115	2				IIIS
			CULG				0115	0657	1				IIIS
			CULG				0120	0425	1				IS
	0406	0425	WEIS										
			CULG				0425	0657					IS,W
			WEIS				0754	1715	2				IIIN
	0743	1836	WEIS				0835	1724	1				IN
	2032	2400	CULG	2100	2400	1							C
			CULG				2100	2400	2				IIIS
			CULG				2100	2400	1				IS,C
			CULG				2100	2400	1				N,RS,DP
09	0000	0715	CULG				0000	0635	1				IIIS
			CULG				0000	0635	1				N,RS,DP
			CULG				0000	0705	1				IS,C,DC
			CULG	0339	0340	1							IIIG
	0406	1315	WEIS				0442	1129	2				IN
			WEIS				0452	1538	1				IIIN
			WEIS				1232.3	1242	3				IIIGG
	1357	1837	WEIS				1724.7	1729.6	3				IIIGG
	2032	2400	CULG				2100	2400	1				IS,C,DC
			CULG				2151	2317	1				IIIN
			CULG	2152		1	2152		1				IIIB
			CULG				2249	2250	2	2249.5	2250	1	IIIG,V
			CULG				2310.5		1				IIIB
10	0000	0730	CULG				0000	0645	1				IN
			CULG				0032.5	0033	2				IIIG
			CULG				0034	0053	1				IIIN
			CULG				0044	0045	2				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

JUNE 1977

	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
10			CULG				0249	0256	1				IIIG
			CULG				0334.5						IIIB,W
			CULG				0346	0356.5	2				IIIGG
	0405	1837	WEIS				0432	0716					IN
			CULG				0456	0630					IIIN,W
			WEIS				0513.3	0513.4	1				IIIB
			WEIS				0754.7	0755	2				IIIB
			WEIS				1105.1	1105.3	1				IIIG
			WEIS				1457.7	1459.7	2				IIIG
	2032	2400	CULG	2105	2106	1							I
			CULG				2120	2158					IN,W
			CULG				2133	2134	2				IIIG
			CULG				2135						IIIB,W
			CULG				2213	2224					IIIN,W
			CULG	2245	2251	1							I
			CULG				2304	2305	1				IIIG
11	0000	0730	CULG	0004	0252								IN,W
			CULG				0004	0350	1				IN
			CULG				0050	0051	1				IIIG
	0404	0518	WEIS				0706	1107					I
	0650	1838	WEIS				1512.6	1512.7	1				IIIB
	2032	2400	CULG	2150	2400								IN,W
12	0000	0730	CULG										
	0405	1206	WEIS										
	1239	1838	WEIS										
	2032	2400	CULG										
13	0000	0730	CULG										
	0405	1712	WEIS										
	2033	2400	CULG										
14	0000	0730	CULG										
	0639	1839	WEIS										
	2033	2105	CULG										
	2215	2400	CULG				2252	2254	1				IIIG
15	0000	0730	CULG				0240		1				IIIB,U
			CULG				0241		1				IIIB,U
			CULG				0410.5	0411	2				IIIG
	0405	1302	WEIS				0410.5	0411.1	1				IIIG
			WEIS				0433.4	0433.5	1				IIIG
			CULG				0433.5		1				IIIB
	1306	1440	WEIS										
	2033	2400	CULG				2344	2344.5	2				IIIG
16	0000	0730	CULG										
	1405	1805	WEIS										
	2033	2400	CULG										
17	0000	0730	CULG	0055.5	0056	1							FAST DRIFT
	0405	1841	WEIS										
	2033	2400	CULG										
18	0000	0732	CULG										
	0406	0859	WEIS										
	0923	1840	WEIS										
	2034	2400	CULG										
19	0406	1439	WEIS				0534.1	0534.3	1				IIIB
	0000	0730	CULG				0534		2				IIIB
			WEIS				0714.8	0715	1				IIIB
	1557	1841	WEIS										
	2035	2401	CULG										
20	0406	1842	WEIS										
	0000	0732	CULG				0650.5		1				IIIB
	2034	2205	CULG				2203	2203.5					IIIG,W
	2210	2400	CULG										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

JUNE 1977

	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
21	0000	0733	CULG										
	0406	0750	WEIS										
	0824	1842	WEIS										
	2034	2400	CULG										
22	0000	0733	CULG	0126.5		1	0126.5		1				IIIB
			CULG				0323.5	0324	1				IIIG,U
	0405	1324	WEIS										
	1340	1842	WEIS				1512.1	1512.3	2				IIIG
			WEIS				1649.6	1649.7	2				IIIG
	2035	2400	CULG	2116.5	2118	1							FAST DRIFT
			CULG				2117.5	2118	1				IIIG,U
23	0000	0733	CULG	0011	0012								IIIG,W
			CULG	0014.5	0015		0014.5	0015					IIIG,W
			CULG	0016.5	0017.5	1	0016.5	0017.5					IIIG,U
			CULG				0021.5	0030	1				II
			CULG				0259	0300	1				IIIG,U
	0407	1842	WEIS				1518.9	1520.9	2				IIIG
			WEIS				1721.5	1723.4	3				IIIG
			WEIS				1830.6	1830.7	1				IIIB
	2035	2400	CULG	2110	2112	2	2110	2112	2	2110.5	2112	2	IIIGG,V,U
			CULG				2117.5	2125	1				II
			CULG				2137	2138	1				IIIG
			CULG				2140	2141	2				IIIG
			CULG				2203.5						IIIB,W
			CULG				2232.5		1				IIIG
			CULG				2239	2246	2				IIIGG
			CULG				2300.5	2301	1				IIIG,U
			CULG	2313.5		1	2313	2314.5	2				IIIG
			CULG				2337	2338	2				IIIG
24	0000	0725	CULG				0057.5	0058					IIIG,W
			CULG	0112	0112.5		0112	0112.5					IIIG,W
			CULG	0114.5	0120.5	1	0114.5	0120.5	2				IIIGG
			CULG	0121	0122	1	0121	0122	2				IIIG,V,U
			CULG				0321						IIIB,W
			CULG				0326	0328.5	1				IIIGG,U
			CULG				0352	0353	1				IIIG
	0406	0639	WEIS										
			CULG				0605						IIIB,W
	0722	1842	WEIS				0835.8	0854.0	2				IIIN
	2037	2400	CULG				2218.5		1				IIIB
25	0000	0734	CULG				0020.5		1				IIIB
			CULG				0026	0029					IIIG,W
			CULG				0106		1				IIIB
			CULG				0500.5	0501.5	1				IIIG
			CULG				0519.5	0520	1				IIIG
			CULG				0528		2				IIIB
			CULG				0529						IIIB,W
			CULG				0533	0533.5					IIIG,W
			CULG				0538		1				IIIB
	0404	1222	WEIS				1051.0	1805.5	2				IN
	1245	1843	WEIS				1512.2	1512.8	2				IIIG
			WEIS				1647.1	1647.7	3				IIIG
			WEIS				1648.6	1648.8	1				IIIG
			WEIS				1651.3	1654.1	3				IIIG
			WEIS				1657.4	1658.9	3				IIIG
			WEIS				1707.1	1707.3	2				IIIB
			WEIS				1751.6	1751.7	1				IIIB
			WEIS				1755.8	1757.3	3				IIIG
			WEIS				1822.2	1822.3	2				IIIG
	2035	2400	CULG				2110	2355	1				IS
			CULG				2111	2400	1				IIIN
			CULG	2119	2159	1							IN
			CULG	2120	2122	1	2120	2122	1				IIIG,U
			CULG				2158	2159.5	1				IIIG,U
			CULG	2235	2243.5	2	2235	2243.5	2				IIIGG,U
			CULG				2310	2317	2				IIIG,U

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

JUNE 1977

	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
26	0000	0734	CULG				0000	0127	1				IIIN
			CULG				0020	0551					IN,W
			CULG				0032	0032.5	2				IIIG,U
			CULG	0104.5		1	0104.5		2				IIIB,U
			CULG	0118	0118.5	1	0118	0118.5	1				IIIG,U
			CULG				0127	0210	1				IIIS
			CULG				0210	0645	1				IIIN
	0408	1844	WEIS				0419.2	1812.8	1				IIIN
			WEIS				1421.8	1423.3	2				IIIG
			WEIS				1435.5	1438.8	2				IIIG
			WEIS				1802.5	1802.6	2				IIIB
	2035	2400	CULG				2104	2400	1				IS,C,DC
			CULG				2104	2400	1				IIIS
			CULG				2130	2400	1				S,RS,DP
27			CULG				0000	0620	1				S,RS,DP
			CULG				0000	0655	1				IIIS
	0000	0735	CULG				0000	0705	1				IS,C,DC
			CULG				0202	0203	2				DC
	0407	0413	WEIS										
	0711	1843	WEIS				0718	1718.5	1				IIIN
			WEIS				0910	1819	1				IN
			WEIS				1451.8	1453	3				IIIG
			WEIS				1504.1	1504.4	2				IIIG
			WEIS				1632.9	1633.4	2				IIIG
	2035	2400	CULG				2106	2400	1				IS,DC
			CULG				2115	2400	1				IIIS
			CULG	2121.5	2122	1							FAST DRIFT
			CULG				2237		2				IIIB
28			CULG				0000	0645					IIIS,W
	0000	0735	CULG				0000	0700					IS,W
			CULG	0156.5	0157	1							FAST DRIFT
			CULG	0201.5		1							IIIB
			CULG				0404.5	0405	2	0404.5	0405	2	IIIG
	0408	1241	WEIS				0418.5	1444	1				IN
			WEIS				0423.3	0425.2	2				IIIG
			CULG				0424.5	0425	2	0424.5	0425	2	IIIG
			WEIS				0435	1348	1				IIIN
	1252	1843	WEIS										
			CULG				2110	2400					IIIS,W
	2035	2400	CULG				2110	2400					IS,W
29			CULG				0000	0505					IIIS,W
	0000	0715	CULG				0000	0705					IS,W
			CULG	0141.5	0142	1	0141.5	0142	2				IIIG,U
			CULG				0227	0410	1				N,RS,DP
			CULG				0310.5		1				IIIB
	0408	1843	WEIS				0427.8	1429.3	1				IIIN
			CULG				0505	0600	1				IIIS
			CULG				0600	0700					IIIS,W
			WEIS				0750	0755.6	1				IIIG
			WEIS				0810.6	0810.7	2				IIIB
	2035	2400	CULG				2110	2400	1				IS,DC
			CULG				2115	2400	2				IIIS
			CULG				2150	2400	1				N,RS,DP
30			CULG				0000	0705	2				IIIS,U
	0000	0735	CULG				0000	0705	1				IS,DC
			CULG				0000	0700	1				N,RS,DP
			CULG				0009.5	0012	2				DC
	0408	1843	WEIS				0733	1810.7	2				IIIN
			WEIS				1109.5	1732	2				IN
	2036	2400	CULG	2107.5	2108		2120	2320					IW
			CULG				2120	2400					IIIS,W
			CULG				2125	2350	1				N,RS,DP
			CULG				2202.5		2				IIIE
			CULG				2204.5		2				IIIB
			CULG				2320	2400	1				IS,DC

The symbols used in connection with the spectral type in describing the important bursts are as follows:

B = Single burst
G = Small group (< 10) of bursts
GG = Large group (> 10) of bursts
C = Underlying continuum (particularly with type I)
S = Storm in the sense of intermittent but apparently connected activity
N = Intermittent activity in this period
U = U-shaped burst of Type III
RS = Reverse slope burst
DP = Drifting pairs
DC = Drifting Chains
H = Herringbone
W = Weak
P = Pulsations
CONT = Continuum
UNCLF = Unclassified activity

GEOMAGNETIC ACTIVITY INDICES

JUNE 1977

Day		Three-Hourly Indices Kp									Three-Hourly Indices Km								Ap	aa *					Cp
		1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8		N	S	M			
1		2+	2	1+	1	2-	2+	3+	3	17	2	2	2-	1+	2	3-	3-	3-	9	22	13	13	23		0.5
2	D1*	4-	3-	2+	2	3-	3	2-	4+	22+	3+	3-	2+	2-	3-	2+	3-	4-	14	30	19	20	31		0.8
3	Q0	2-	2	2	1+	2	0+	1	2	12+	1+	2	2-	1	2	1-	1-	2-	6	16	8	13	12	C	0.3
4	Q6	2	2	1+	2	2	1	1-	1-	12-	2-	2-	2-	2-	2-	1	1-	1-	5	18	6	14	10	CC	0.2
5		1+	2	1	2+	3+	2-	1-	1	13+	1+	2	1+	2+	3	1+	1-	1-	7	16	14	12	19	D	0.4
6	Q5	2-	1+	2	1	1+	1-	1-	2-	10+	2	1+	2-	1	1+	0+	1-	1+	5	13	7	9	11	CK	0.2
7		1-	1	2-	2-	2	1	3-	2-	12+	1-	1-	1	2-	2-	1-	2+	1+	6	17	6	10	13	CC	0.3
8	Q7	0+	1	2-	1+	2	2	2-	2	12	0+	1	2-	1+	2-	1+	1+	2-	6	18	7	9	16	CC	0.2
9	Q8	1+	1	2	1	1	1	2-	3-	12-	2-	1	2-	1	1-	1-	1+	2+	6	17	6	10	13	C	0.3
10		3	3-	2+	2	1+	1-	2-	2-	15+	3-	3-	2+	2	1+	1-	1	2-	8	19	7	17	9	CC	0.4
11	Q2	1-	2-	1-	0+	1-	0+	1	2	7+	1	1+	1-	0+	1-	0+	1	2-	4	11	5	7	9	CC	0.1
12	Q3	2	1+	0+	0	0+	0+	2	1+	8-	2-	1+	1-	0	0+	0+	2	1+	4	13	5	9	10	CC	0.1
13		1+	2-	1+	1-	1	1	2	3	12	1+	2-	1+	1	1-	1-	1+	3-	6	13	4	6	11	CK	0.3
14		4	3-	2	1+	1+	1-	2-	2	16-	4-	3-	2+	1+	1+	1-	1+	2	9	21	10	22	9	K	0.5
15	Q1	1-	1+	1-	0+	0+	0+	1+	1+	6+	1	1+	0+	0+	0	0+	1+	1+	3	13	4	8	9	CC	0.1
16		2-	1+	1	1+	3	4-	3-	2	17-	1+	1	2-	2-	3-	3	2+	2-	10	22	8	8	23	K	0.5
17		2	3-	2+	1+	2+	3-	1+	2	17-	2	3-	2+	2-	2	2	1+	2-	8	22	8	14	16		0.4
18	D5*	1	2	3+	2	1+	3-	3	3-	18	1+	2	3	2+	2	2+	3-	3-	10	25	15	16	25		0.6
19		2+	3-	3-	2	2+	3	1+	2	18+	3-	2+	2+	3-	2+	3-	1+	1+	10	23	11	14	21		0.5
20	D3*	4-	3-	3	2	3-	1+	2	1+	19-	3	2+	3	2	3-	1+	2-	1+	11	26	14	25	15		0.6
21		1-	2+	2+	2-	2+	2-	1+	1	13+	1	2-	2	2-	2-	2-	2-	1+	6	17	8	13	12	CK	0.3
22		2-	1+	1-	1	3	3+	4	2-	17-	2-	1+	1	1+	3-	3-	3	1+	10	31	11	18	32		0.6
23	D4*	4	3	2-	1+	2+	2+	2-	1+	18-	3+	3-	2-	1+	2	2	1+	2-	10	25	7	19	14		0.6
24		2	3-	3-	1	1	2-	2-	2	15-	2-	3-	3-	1+	1	2-	2-	2	7	20	8	17	11	K	0.4
25	Q4	1+	1	1	1	2-	2	1	1+	10+	2-	1+	1+	1+	2-	1+	1-	1	5	12	8	9	12	CC	0.2
26	Q9	2-	2-	2-	2	2-	2-	1-	2-	13-	1+	1+	2-	2-	1+	1+	1-	1+	6	14	8	11	11	CC	0.3
27		3	2	2-	1+	2-	2-	2	1-	14	2+	2	2-	1+	2-	2-	2	1	7	19	8	15	12	C	0.3
28	D2*	2-	3-	3	3+	3	3-	3-	2+	21+	2-	2+	3-	3+	3-	2+	3-	2+	12	28	17	25	20		0.7
29		3	2+	2-	1+	1	2-	1	2-	14-	3-	2+	2+	2	1+	2-	1	2-	7	17	9	14	13	C	0.3
30		2-	1+	1+	2-	2	3-	3+	3-	17-	2	1+	2	2	2-	2-	3-	3-	9	20	9	9	21		0.5
																			Mean	8	19.2	9.0	14.3		0.38

Day	Three-Hourly Indices Kn								Three-Hourly Indices Ks							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1	2+	2+	2	1+	2+	2+	3	3-	2-	2	1+	1-	1+	3-	3-	2+
2	3+	3-	2+	2	3-	3	2+	3+	3+	3-	2+	1+	2+	2	3-	4-
3	1+	2+	2-	1	2+	1-	1+	2	1+	2	2-	1	1+	0+	0	1
4	2	2-	2-	2+	2+	1+	1	1	1+	2-	2-	1-	1	1-	1-	0
5	1+	2	2-	3-	3	1+	1+	1	1+	2+	1+	2	3	1	0+	0+
6	2	1+	2	1	1+	1-	1	2-	2+	1	1+	1-	1	0	1-	1
7	1	1	1+	2	2	1+	3-	2-	0+	1-	1-	1+	1+	0+	2	1+
8	1-	1+	2-	2-	2	2	2-	2	0	1-	1+	1-	2-	1-	1	1+
9	1+	1+	2	1+	1	1+	2-	2+	2-	1-	1+	1-	0+	0+	1+	2+
10	3	3	2+	2+	1+	1	2-	2-	3-	3-	2+	2	1+	0	0	1+
11	1	2-	1	1-	1	0+	1	2	1-	1+	1-	0	1-	0	1	2-
12	2-	1+	1-	0+	0+	0+	2	1+	2-	1+	0+	0	0	0	2	1+
13	1+	2-	1+	1	1-	1+	2	3	1+	2-	1+	1-	1-	0+	1-	2
14	3+	3-	2+	1+	2-	1	2-	2-	4-	3-	2+	1+	1	0+	1+	2
15	1	1+	1-	1-	0+	1-	1+	1+	1	1+	0	0	0	0	1+	1-
16	1+	1+	2-	2	3+	4-	3-	2+	1+	1-	1+	1+	2	3-	1+	1
17	2+	3	3-	2-	2+	3-	2	2	2-	2+	2-	1+	2	1+	1-	1+
18	1+	2+	4-	2+	2	3-	3	3	1	1+	3-	3-	2+	2-	3-	2
19	2+	3-	2+	3-	3-	3-	2-	2	3-	2	2+	2+	2-	2+	0+	1-
20	3	3-	3	2+	3-	2-	2-	2-	3+	2+	3-	2-	3	1-	2-	1
21	1+	2	2+	2	2+	2	1+	1+	1-	1+	2-	1+	1+	1+	2-	1-
22	2	1+	1+	2-	3	3	3+	2	1	1+	1-	1	2	2-	3	1
23	3+	3-	2-	1+	2+	2+	2-	2-	3	2+	1+	1	1+	2-	1+	1+
24	2	3	3	1+	2-	2	2	3-	1+	3-	3-	1-	0+	1	1+	1+
25	1+	2-	2-	1+	2	2-	1	1+	2-	1+	1	1	1+	1-	0+	1-
26	2-	1+	2-	2+	2-	1+	1	2-	1+	1+	1+	1+	1	1+	0+	0+
27	3-	2	2-	2-	2	2	2+	2-	2	2	2-	1-	1	1+	2-	0
28	2-	3-	3-	3+	3	3-	3-	2+	1+	2+	2+	4-	2	2-	3	3-
29	2+	2+	2+	2+	1+	2	1+	2+	3-	3-	2+	1+	1	1	1-	1+
30	2	2-	2+	2+	2	2+	3-	3-	2	1+	1+	2-	1+	1-	2+	3-

* Errata: Note that the N and M values of aa published in these tables for January 1974 through January 1977 values were slightly in error. The correct values (resulting in some modifications in the classification of the days C and K) will be given in a supplementary IAGA Bulletin and the Bulletin 32 series. The magnetic tape deposited in World Data Center A for Solar-Terrestrial Physics has been corrected.

ADDENDUN: These data include the June Km, Kn, Ks data which were missing in SGD 396 Part I, page 111.

Quiet days (Q) and disturbed days (D), geomagnetic planetary three-hour-range indices (Kp) (integers alone are equivalent to those normally given with a small zero), magnetic character figures (Cp), and average amplitude (Ap) (unit 2γ) prepared by Geophysikalisches Institut at the University of Göttingen, F.R. of Germany for the International Service of Geomagnetic Indices. Ten most quiet days [Q1-Q0(10)] and five most disturbed days [D1-D5] are ordered from most quiet or disturbed, respectively. A or K means "not really quiet" (A = "Ap>6", K = "Ap <6 but one Kp ≥3o or two Kp values >3-"). An * means "not really disturbed" (Ap<20).

Geomagnetic three-hourly indices (Kn), (Ks) and (Km) as in IAGA-Bulletin No. 32 and indices (aa), "antipodal", as in IAGA-Bulletin No. 33 prepared by P. N. Mayaud of the Institut de Physique du Globe, Paris, France. Really quiet (C) and quiet but slightly disturbed three-hourly intervals (K) are given for 24-hour and 48-hour intervals centered on 12 UT.

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UAG-40 "H-Alpha Synoptic Charts of Solar Activity For the Period of Skylab Observations, May, 1973-March, 1974", by Patrick S. McIntosh, NOAA Environmental Research Laboratories, February 1975, 32 pages, price 56 cents.

UAG-41 "H-Alpha Synoptic Charts of Solar Activity During the First Year of Solar Cycle 20, October, 1964 - August, 1965", by Patrick S. McIntosh, NOAA Environmental Research Laboratories, and Jerome T. Nolte, American Science and Engineering, Cambridge, Massachusetts, March 1975, 25 pages, price 48 cents.

UAG-42 "Observations of Jupiter's Sporadic Radio Emission in the Range 7.6-80 MHz 10 December 1971 through 21 March 1975", by James W. Warwick, George A. Dulk, and Anthony C. Riddle, Department of Astro-Geophysics, University of Colorado, Boulder, Colorado 80302, April 1975, 49 pages, price $1.15.

UAG-43 "Catalog of Observation Times of Ground-Based Skylab-Coordinated Solar Observing Programs", compiled by Helen E. Coffey, World Data Center A for Solar-Terrestrial Physics, May 1975, 159 pages, price $3.00.

UAG-44 "Synoptic Maps of Solar 9.1 cm Microwave Emission from June 1962 to August 1973", by Werner Graf and Ronald N. Bracewell, Radio Astronomy Institute, Stanford University, Stanford, California 94305, May 1975, 183 pages, price $2.55.

UAG-45 "Auroral Electrojet Magnetic Activity Indices AE (11) for 1972", by Joe Haskell Allen, Carl C. Abston and Leslie D. Morris, National Geophysical and Solar-Terrestrial Data Center, Environmental Data Service, May 1975, 144 pages, price $2.10.

UAG-46 "Interplanetary Magnetic Field Data 1963-1974", by Joseph H. King, National Space Science Data Center, NASA Goddard Space Flight Center, Greenbelt, Maryland 20771, June 1975, 382 pages, price $2.95.

UAG-47 "Auroral Electrojet Magnetic Activity Indices AE (11) for 1973", by Joe Haskell Allen, Carl C. Abston and Leslie D. Morris, National Geophysical and Solar-Terrestrial Data Center, Environmental Data Service, June 1975, 144 pages, price $2.10.

UAG-48A "Synoptic Observations of the Solar Corona during Carrington Rotations 1580-1596 (11 October 1971 - 15 January 1973)", [Reissue with quality images] by R. A. Howard, M. J. Koomen, D. J. Michels, R. Tousey, C. R. Detwiler, D. E. Roberts, R. T. Seal and J. D. Whitney, E. O. Hulbert Center for Space Research, NRL, Washington, D. C. 20375 and R. T. and S. F. Hansen, C. J. Garcia and E. Yasukawa, High Altitude Observatory, NCAR, Boulder, Colorado 80303, February 1976, 200 pages, price $4.27.

UAG-49 "Catalog of Standard Geomagnetic Variation Data", prepared by Environmental Data Service, NOAA, Boulder, Colorado, August 1975, 125 pages, price $1.85.

UAG-50 "High-Latitude Supplement to the URSI Handbook on Ionogram Interpretation and Reduction", by W. R. Piggott, British Antarctic Survey, c/o SRC, Appleton Laboratory, Ditton Park, Slough, England, October 1975, 292 pages, price $4.00.

UAG-51 "Synoptic Maps of Solar Coronal Hole Boundaries Derived from He II 304Å Spectroheliograms from the Manned Skylab Missions", by J. D. Bohlin and D. M. Rubenstein, E. O. Hulbert Center for Space Research, Naval Research Laboratory, Washington, D. C. 20375 U.S.A., November 1975, 30 pages, price 54 cents.

UAG-52 "Experimental Comprehensive Solar Flare Indices for Certain Flares, 1970-1974", compiled by Helen W. Dodson and E. Ruth Hedeman, McMath-Hulbert Observatory, The University of Michigan, 895 Lake Angelus Road North, Pontiac, Michigan 48055 U.S.A., November 1975, 27 pages, price 60 cents.

UAG-53 "Description and Catalog of Ionospheric F-Region Data, Jicamarca Radar Observatory (November 1966 - April 1969)", by W. L. Clark and T. E. Van Zandt, Aeronomy Laboratory, NOAA, Boulder, Colorado 80302 and J. P. McClure, University of Texas at Dallas, Dallas, Texas 75230, April 1976, 10 pages, price 33 cents.

UAG-54 "Catalog of Ionosphere Vertical Soundings Data", prepared by Environmental Data Service, NOAA, Boulder, Colorado 80302, April 1976, 130 pages, price $2.10.

UAG-55 "Equivalent Ionospheric Current Representations by a New Method, Illustrated for 8-9 November 1969 Magnetic Disturbances", by Y. Kamide, Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder, Colorado 80302 and Geophysical Institute, University of Alaska, Fairbanks, Alaska 99701, H. W. Kroehl, Data Studies Division, NOAA/EDS/NGSDC, Boulder, Colorado 80302, M. Kanamitsu, Advanced Study Program, National Center for Atmospheric Research, Boulder, Colorado 80303, J. H. Allen, Data Studies Division, NOAA/EDS/NGSDC, Boulder, Colorado 80302, and S.-I. Akasofu, Geophysical Institute, University of Alaska, Fairbanks, Alaska 99701, April 1976, 91 pages, price $1.60.

UAG-56 "Iso-intensity Contours of Ground Magnetic H Perturbations for the December 16-18, 1971 Geomagnetic Storm", by Y. Kamide, Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder, Colorado 80302 and Geophysical Institute, University of Alaska, Fairbanks, Alaska 99701 (currently Guest worker at Data Studies Division, NOAA/EDS/NGSDC, Boulder, Colorado 80302), April 1976, 37 pages, price $1.39.

UAG-57 "Manual on Ionospheric Absorption Measurements", edited by K. Rawer, Institut für Physikalische Weltraumforschung, Freiburg, G.F.R., June 1976, 202 pages, price $4.27.

UAG-58 "ATS6 Radio Beacon Electron Content Measurements at Boulder, July 1974 - May 1975", by R. B. Fritz, Space Environment Laboratory (currently with Wave Propagation Laboratory), NOAA, Boulder, Colorado 80302 USA, September 1976, 61 pages, price $1.04.

UAG-59 "Auroral Electrojet Magnetic Activity Indices AE(11) for 1974", by Joe Haskell Allen, Carl C. Abston and Leslie D. Morris, National Geophysical and Solar-Terrestrial Data Center, Environmental Data Service, December 1976, 144 pages, price $2.16.

UAG-60 "Geomagnetic Data for January 1976 (AE(7) Indices and Stacked Magnetograms)" by J. H. Allen, C. A. Abston and L. R. Morris, NGSDC/EDS/NOAA, July 1977, 57 pages, price $1.07.

UAG-61 "Collected Data Reports for STIP Interval II 20 March - 5 May 1976", edited by Helen E. Coffey and John A. McKinnon, National Geophysical and Solar-Terrestrial Data Center, Environmental Data Service, August 1977, 313 pages, price $2.95.

UAG-62 "Geomagnetic Data for February 1976 (AE(7) Indices and Stacked Magnetograms)" by J. H. Allen, C. A. Abston and L. R. Morris, NGSDC/EDS/NOAA, September 1977, 55 pages, price $1.07.

UAG-63 "Geomagnetic Data for March 1976 (AE(7) Indices and Stacked Magnetograms)" by J. H. Allen, C. A. Abston and L. R. Morris, NGSDC/EDS/NOAA, September 1977, 57 pages, price $1.07.

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